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ABSTRACT

This volume is the first of three which report the results of the five-year Education Improvement Program in Durham, North Carolina. Volume I describes the original proposal, the research strategies employed, the intervention rationale, the curricular programs developed, the characteristics of the subjects and their families, and the results of the overall program of educational intervention. Approximately one-half the document consists of tables, charts, and graphs. The three volumes together constitute the final report to the Ford Foundation. Followup studies using the data gathered during the five-year span of the program will be conducted during the next few years and reported in the appropriate professional journals. Volume II is catalogued under PS 004 676 and Volume III is PS 004 677. (NH)

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DURHAM EDUCATION IMPROVEMENT PROGRAM

ED050814

Final Report

Volume I

Educational Intervention in Early Childhood

A Report of a Five-Year Longitudinal Study of the Effects of Early Educational Intervention in the Lives of Disadvantaged Children in Durham, North Carolina

by

Robert L. Spaulding

Director

Education Improvement Program

Duke University

The Durham Education Improvement Program was a project of the Ford Foundation under the auspices of the Southern Association of Colleges and Schools whose Education Improvement Project is funded by the Ford and Danforth Foundations. It was jointly administered by Duke University, North Carolina Central University, Durham City Schools, Durham County Schools, and Operation Breakthrough, Inc.

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THE DURHAM EDUCATION IMPROVEMENT PROGRAM

A Project of the Ford Foundation

Under the auspices of the Southern Association of Colleges and Schools whose Education Improvement Project is funded by the Ford and Danforth Foundations.

JOINTLY ADMINISTERED BY:

Duke University, North Carolina Central University, Durham City Schools, Durham County Schools, and Operation Breakthrough, Inc.

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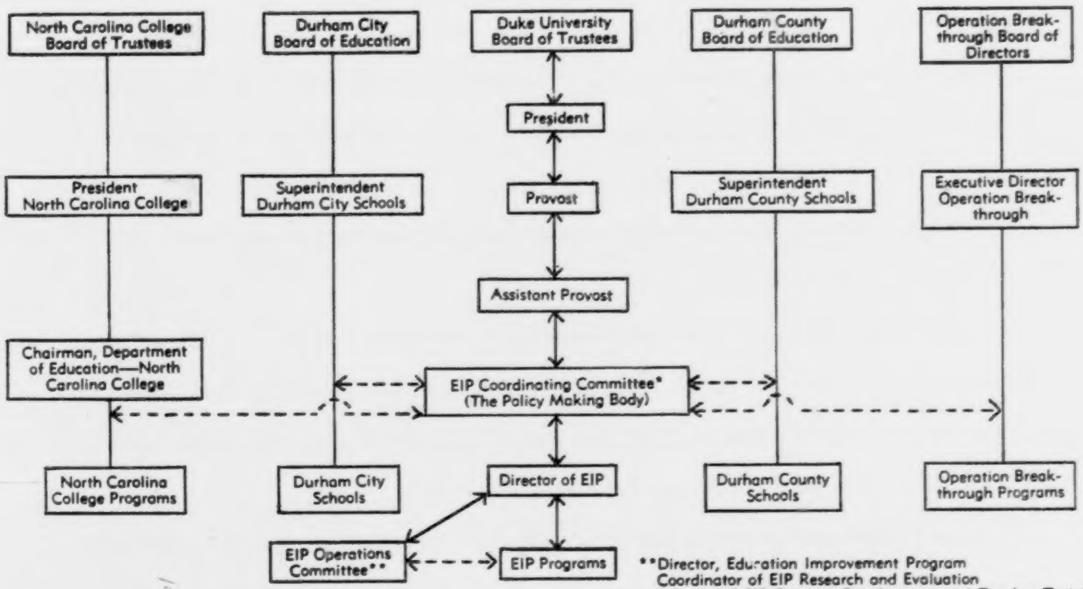
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Principal, Lakeview School
Principal, Pearson School
Principal, Southside School

Preface

This volume is the first of three which report the results of the five-year Education Improvement Program in Durham, North Carolina. Volume I describes the original proposal, the research strategies employed, the intervention rationale, the curricular programs developed, the characteristics of the children and their families, and the results of the overall program of educational intervention.

Volume II contains appendixes to the first volume. It reports on related topics such as EIP publications, dissemination activities, instructional resources made available to EIP teachers, evaluations by outside agents including the Educational Testing Service, health conditions of project children and families, and instruments used in data collection.

Volume III consists of abstracts of special studies conducted by investigators in the Program.

The three volumes, together, constitute the Final Report to the Ford Foundation. Follow-up studies using the data gathered during the five-year span of the Program will be conducted during the next few years and reported in the appropriate professional journals.

The Durham Education Improvement Program was planned, funded, staffed, developed, guided, inspired, supported, and reported through the combined efforts of a large number of individuals. It is not possible to name all of them. The names of many are, in fact, unknown. On the next several pages the names and roles of those employed in the Program or serving on governing committees are given. Not named are the hundreds of children who attended the target and comparison schools. The support and trust of these children and their families was crucial to the success of the project. To them the EIP staff is very much indebted and to them this report is dedicated.

The final report could not have been completed without the very able assistance of Dolores Clement, Mary Papageorgiou, Susan Walker, and Bill Lessig of Duke University, and Ann Miller, Jim Dobbins, and Tom Briley of the Regional Education Laboratory for the Carolinas and Virginia.

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1965-1970

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- EDUCATIONAL SEQUENCE
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    - Nicholas J. Anastasiow (2 years)
  - Program Associate
    - Kanawha Z. Chavis (1 1/2 years)
  - Assistant Director for Curriculum
    - Loretta Golden (2 years)
  - Coordinator of Pre-Schools
    - Else W. Hjertholm (2 years)
  - Nursery Teachers
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    - Sandra J. Pilgrim (3 years)
    - Wilhelmina K. Rotella (2 years)
    - Cheryl S. Sarratt (1 year)
  - Pre-School Teachers
    - Martha S. Abbott (2 years)
    - Sylvia T. Bullock (1 1/2 years)
    - Martha P. Campbell (5 years)
    - Joan H. Cox (1 year)
    - H. Nancy Durway (2 years)
    - Marie Hinman (2 months)
    - Othella G. Johnson (1 year)
    - Karen L. Knopf (1 year)
    - Aloha V. Peyton (5 years)
    - Jean S. Rooks (2 years)
    - Marilyn L. Rothbard (2 years)
    - Polly A. Stark (1 year)
    - Diane S. Turner (2 years)
    - Virginia L. Walker (1 year)
  - Ungraded Primary Teachers
    - Martha J. Adair (1 year)
    - Alma W. Bennett (4 years)
    - Barbara O. Cooper (3 years)
    - Camille E. Cunningham (2 years)
    - Geneva E. Dillard (3 years)
    - Louisa M. Douglass (4 years)
    - Linda Finkelstein (1 month)
    - Lynn M. Gravely (1 year)
    - Lossie Mason (2 years)
    - Phyllis A. May (3 years)
    - Cora H. Peaks (4 years)
    - Margaret M. Vitz (8 months)
    - Roberta H. Welch (3 years)
    - Bernice H. Willis (1 year)
    - Carole L. Woltman (2 months)
  - Ungraded Primary Assistant Teachers
    - Eric A. Baylin (1 year)
    - Jere N. Blackburn (1 year)
    - Elizabeth A. Conroy (1 year)
    - Margie Harrington (3 years)
    - Mae G. Jones (4 years)
    - Eric H. Kurz (1 year)
    - John W. Lindsey (1 1/2 years)
    - Carl F. Nyblade (7 months)
    - Margaret H. Small (2 1/2 months)
  - Teacher Aides
    - Karen L. Bauer (2 months)
    - David K. Birkhead (1 year)
    - Ilene L. Britt (1 1/2 years)
    - Bonnie M. Brown (6 months)
    - Julia D. Dawson (1 1/2 years)
    - Geraldine Fuquay (6 months)
    - Charles H. Guy III (6 months)
    - Lonnie G. Hatley (3 months)
    - Christine V. Hodges (2 years)
    - Constance Lowe (1 year)
    - Maxine H. Mason (6 months)
    - Barbara J. McNair (2 years)
    - Rochell Peoples (1 month)
    - Clementine F. Self (1 year)
    - Lula F. Taborn (4 months)
    - Jean L. Thompson (2 years)
    - Leevan Williams (3 years)
  - Cafeteria Supervisors
    - Lula K. Bagley (1 1/2 years)
    - Annie C. Taylor (8 months)
  - School Support Aides
    - Secona R. Bell (1 year)
    - William R. Capel III (7 months)
    - Carey E. Gilmore (2 years)
    - Alice M. Hester (3 1/2 months)
    - Ann Hill (1 year)
    - Brenda J. Jackson (2 years)
    - Thelma B. Lanier (1 year)
    - Clarence M. Templeton III (2 months)
  - Program Specialists
    - Patricia C. Barton (6 months)
    - Jeffrey J. Bayer (1 year)
    - David H. Friedlein (2 1/2 years)
    - James H. Hamlett (2 years)
    - Jean P. Johnson (1 year)
    - Ursula B. Perivier (6 months)

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- Program Specialists (continued)
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  - Harriet Shenkman (2 1/2 years)
  - Jane C. Taylor (2 years)
  - Peggy Wiseman (1 year)
- INSTRUCTIONAL MATERIALS CENTER
  - Audio-Visual Technicians
    - Benjamin T. Mays (1 year)
    - R. Kent Stewart (1 year)
  - Inventory Clerks
    - Thomas L. Tatum (1 year)
    - Willie G. Torain (1 month)
    - Clayton B. Weaver (6 months)
- SCHOOL SOCIAL SERVICES
  - Directors
    - Rosemary F. Funderburg (1 year)
    - Frederica E. Harrison (4 years)
  - Social Workers
    - Eleanor C. Crocker (1 year)
    - Judith S. Lewis (1 year)
    - Clyde H. Penny (2 1/2 years)
    - Paula A. Wallach (3 years)
    - Joan H. Wyatt (1 1/2 years)
  - Social Work Aides
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    - Delores C. McInnes (1 month)
    - Patricia S. Traylor (7 months)
  - UNC Social Work Trainees
    - Lee Cox (1 year)
    - Jerry W. Spinarski (5 months)
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    - Mary A. Musser (1 year)
  - Homemaker-Counselor
    - Nancy T. Bowens (1 year)
  - Food Services Teacher
    - Norma Y. Stock (4 months)
  - Group Leader-Counselors
    - Richard E. Campbell (1 year)
    - Janet S. Corpening (1 month)
    - William R. Erwin (1 year)
    - Jonathan S. Hanna (4 months)
    - Sylvia J. Hunter (1 year)
    - Bettye E. Jones (6 months)
    - Kenneth M. Kastelman (2 months)
  - Group Leader-Counselors (continued)
    - Margaret M. Keith (1 year)
    - Sally H. Poland (1 year)
    - Rowena O. Stevens (1 year)
    - Richard A. Tatum (7 months)
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- RESEARCH AND EVALUATION
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    - Donald J. Stedman (3 years)
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  - School Psychologist
    - Miriam Clifford (2 1/2 years)
  - Research Social Worker
    - Katrena B. Horton (1 year)
  - Data Manager
    - Theodore W. Buschman (1 1/2 years)
  - Research Training Fellow
    - Sally A. Sibley (2 years)
  - Infant Project Follow-up Study Coordinator
    - Maurine LaBarre (5 years)
  - Infant Project Pediatricians
    - Marcel Kinsbourne (1 year)
    - Kay Lewis (1 year)
    - Sara K. Zirkle (1 year)
  - Infant Project Evaluators
    - Lorette P. Fuller (3 years)
    - Charleen G. Gorbet (1 year)
    - Barbara W. Kerton (1 year)
    - Audrey M. Noble (1 year)
    - Tempa O. Pickard (2 years)
    - Judith A. Simpson (2 years)
  - Research Associates
    - Penelope C. Bornhold (1 year)
    - Teresa M. Leonhardt (3 years)
    - Betsy C. Lowman (1 year)
  - Research Technicians
    - Alan Beck (1 year)
    - Harriet L. Bennett (1 year)
    - Irving B. Berenson (5 months)
    - Henry B. Biller (3 months)
    - Henrietta S. Brandt (4 years)
    - Barbara C. Buerger (3 months)
    - S. Adrian Cato (3 1/2 years)
    - Betty P. Cooper (1 year)

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- Research Technicians (continued)
    - Ellen F. Elsas (2 1/2 years)
    - Alexis Epanchin (3 years)
    - Anne J. Funderburk (1 year)
    - Patricia L. Gaines (1 1/2 years)
    - Rebecca H. Gordon (1 year)
    - Carol B. Hass (7 months)
    - Ann A. Hazard (1 year)
    - Jean E. Hoppe (4 months)
    - Frank Kern (2 months)
    - Nancy L. Knapp (1 year)
    - G. Jeanne Mason (3 years)
    - Mary F. McDonald (6 months)
    - Mary S. Menge (2 years)
    - Sheila N. Morrissey (1 year)
    - Eleanor F. Nunn (3 months)
    - Janice D. Oursler (1 year)
    - Frances M. Owen (6 months)
    - Mary R. Papageorgiou (1 year)
    - Maria M. Passos (1 1/2 months)
    - Katherine S. Perry (2 years)
    - Bonnie S. Rothman (2 1/2 months)
    - Paul Scagnelli Jr. (1 year)
    - David W. Sherwood (5 months)
    - Lee H. Spence (3 months)
    - Ben S. Tench (1 year)
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    - Sondra E. Timoll (1 year)
    - Patricia G. Webbink (1 year)
- Educational Technicians
    - Mildred B. Artley (3 1/2 years)
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        - I. Laura Henderson (2 years)
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        - Charles R. Howell (2 1/2 years)
        - Ethel L. Kale (2 years)
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        - Elizabeth B. Kennedy (7 months)
        - Diane C. Landerman (2 months)
        - Linda S. Meadows (3 years)
        - Susan S. Misiewicz (8 months)
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Algernon W. Smith (2 months)
Leroy Vaughn (6 months)

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"First, schools are meant for children, for their development, for their growth, for their pleasures.

"Second, the development of children takes place in a transaction or interaction between student and teacher, around certain materials and experiences that may collectively be called the curriculum.

"It follows from these two simple guides that the success or failure of education is to be measured by what happens to children in this transaction.

"Third, if children fail to develop and grow as we reasonably expect that they should, the shortcomings or errors are to be sought in the structure of the system and not in the innards of the children." MELVIN TUMIN, Princeton University

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CHAPTER ONE
INTRODUCTION

The Problem:
Our Public Schools are Obsolete

Public education in America has evolved over the past century and one half from an institution designed to provide a minimal level of competence in reading, writing, and simple figuring - which was felt necessary to support the development of a democratic society - to a comprehensive system of publicly supported institutions intended to provide equal access for all America's children to the full benefits of citizenship. During the last century and during the early part of this century the less able were allowed to leave school without penalty to work on family farms, in small businesses, or as craftsmen or laborers in developing industries.

As America became fully industrialized it became increasingly necessary to provide a successful elementary educational experience for everyone. The present technological society resulting from advanced industrialization and automation has eliminated a great many of the jobs which do not require an elementary or high school education. The technological trend is expected to continue. A high level of verbal competence and successful school experiences through the twelfth grade have become, in recent years, prerequisites to full employment and job security. Our nation can no longer afford to push out children who do not measure up to academic and social expectations derived from the needs of a pre-technological society.

Teachers must now learn to teach all children, disadvantaged as well as the more favorably born. America's schools must be changed overnight if they are to survive at all.

We can no longer afford to blame the child or his parents for his failure to meet an arbitrary standard. The failure of the child becomes the failure of the teacher - and the community - to serve the child. The public school, to serve all children, must abandon its system of sorting-in the highly verbal and sorting-out the non-verbal and culturally different. Grades, promotions and retentions based on fixed, age-specific performance standards are no longer defensible. The public school must develop successful new techniques and materials, bolster the self-esteem of all children, and make certain that they will learn the necessary skills and knowledge leading to successful and satisfying roles in society.

A Proposal to Develop New Educational Systems and Techniques

In March 1965, the Ford Foundation funded a proposal by Donald J. Stedman of Duke University to develop a comprehensive program of educational intervention in the lives of disadvantaged children. Linked in this proposal were Duke University, North Carolina Central University, the Durham City and County Schools, and Operation Breakthrough (the local anti-poverty agency).

The proposal, as accepted by the Foundation, outlined experimental programs for children at most ages from birth through adolescence. Three target areas, earlier designated by Operation Breakthrough as sites of most distressing poverty, were selected for educational intervention. Programs were planned for infants, toddlers, pre-schoolers, and primary grade children. Youngsters in early adolescence were to be enrolled in programs leading to improved employment opportunities, a stable family life, and effective parenthood.

Not only were plans made to utilize and demonstrate existing knowledge regarding effective educational programs, but a concerted effort was projected to discover and demonstrate more efficient and effective ways of assisting children overcome the debilitating effects of poverty and other forms of environmental disadvantage.

Goals of the Durham Education Improvement Program

The purposes of the Durham Education Improvement Program were the development of new organizational patterns and instructional systems in on-going classrooms in Durham City and County which would foster the educational and social development of children whose families had been economically and socially restricted. The Durham EIP sought to introduce tested school practices as well as develop new and more effective educational materials, techniques, and methods.

Another purpose of the Durham EIP was to stimulate North Carolina school superintendents, principals, curriculum supervisors, teachers, school board members, legislators, and others concerned with educational problems to enter into a broad range of developmental activities in the public schools. Ultimate answers to the problems of economic and social deprivation were not expected but a variety of alternatives were to be explored, which, in combination, would suggest ways in which schoolmen and teachers in cooperation could continue the task of transforming public education in the southeastern region to overcome the cumulative, undesirable effects of inadequate financial support of public schools, a history of separate schooling for blacks and whites, and the continued use of instructional procedures no longer functional in technological America.

In the role of stimulator, EIP was only one of a number of agencies such as Head Start, Follow Through, OEO community action programs (Operation Breakthrough), the Learning Institute of North Carolina, the North Carolina Fund and the North Carolina Comprehensive School Improvement Program which devoted much time and effort toward the improvement of schools and educational opportunity for all children in North Carolina.

The Five-Year Plan

The original proposal to the Ford Foundation projected the creation of a small-scale school system in which approximately 200 to 300 children would be enrolled from ages 2 through 10. This small-scale school system was to be created within and with the support of Durham City and Durham County Schools. Two public schools in the City of Durham and one in the County were selected as target area schools since the children attending them came from geographical areas where low-income families traditionally resided. In addition to the three target area schools, a fourth city school near Duke University was chosen as a laboratory facility. The City Schools had announced plans to close the school as a result of changing residential and school attendance patterns in the City of Durham.

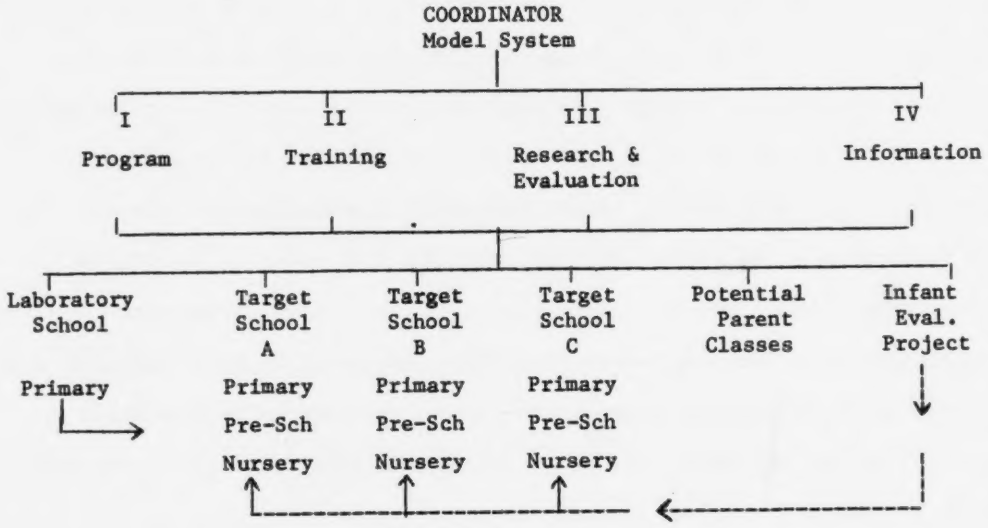
COORDINATOR
Model System
I
Program
II
Training
III
Research &
Evaluation
IV
Information
Laboratory School
Primary
Target School A
Primary
Pre-Sch
Nursery
Target School B
Primary
Pre-Sch
Nursery
Target School C
Primary
Pre-Sch
Nursery
Potential Parent Classes
Infant Eval. Project

Fig. 1.

The overall strategy for the development of the model school system called for the development of new organizational patterns, management procedures, and instructional techniques at the Laboratory School with the concurrent introduction of tested school practices such as team teaching, ungraded instruction, programmed materials, and cross-age grouping in the target area schools.

A special classroom for very young children was constructed on the school grounds of one of the target area schools and some available rooms in the basement of the adjacent school were modified to accommodate older pre-school children. Children selected by random procedures among the pre-school population residing in the three target areas were enrolled in classes in these facilities, and in due course the majority of those enrolled completed the pre-school sequence and entered the public schools.

This model system was expected to provide the Durham City and County Schools an opportunity for in-service training, where successful instructional programs could be observed and generalized to other schools in the city, county, and state.

A program of evaluation was planned to measure the changes brought about by the several trial programs.

The system was intended to provide more than an experimental arena. It was to become an example of coordinated university-community efforts in education. It was expected to advance the practices of team teaching, ungraded classes, and in-service teacher training. It was expected also to become a valuable laboratory for teacher training enterprises at Duke University and North Carolina Central University.

The following outcomes were some of the expected direct and indirect benefits:

1. Knowledge regarding the early health status of children

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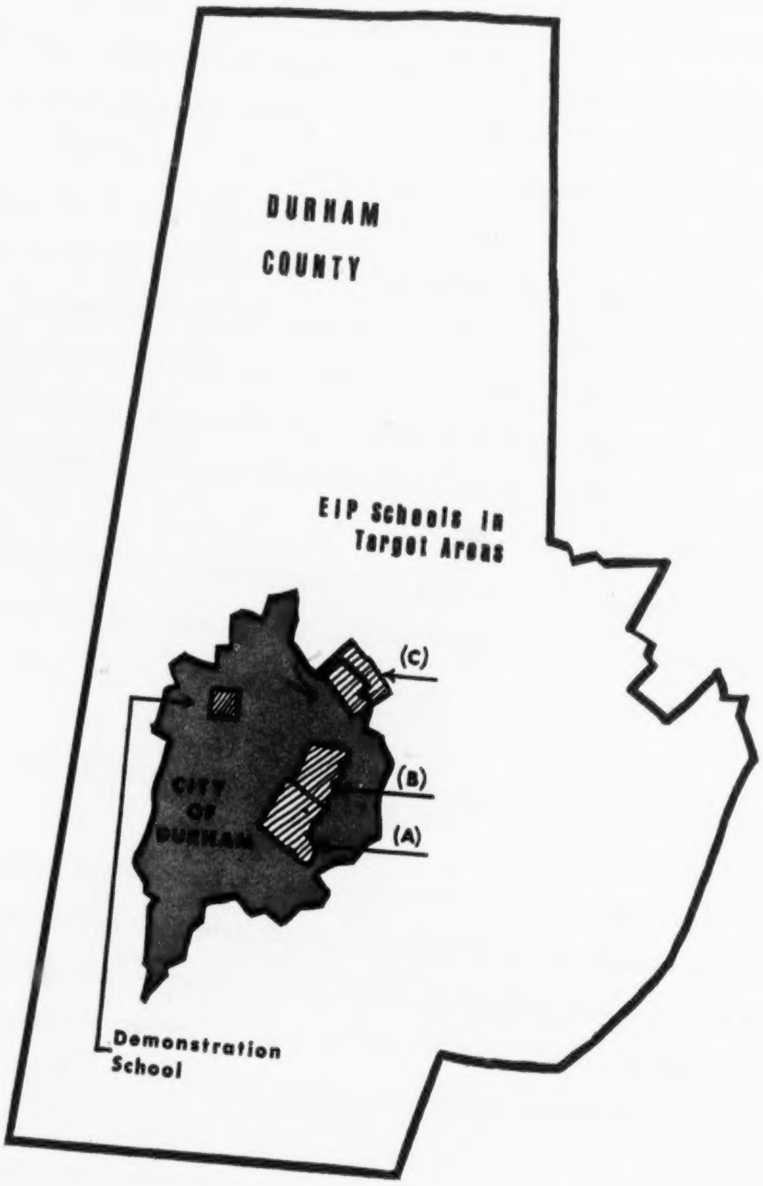
DURHAM COUNTY
EIP Schools in Target Areas
(C)
(B)
(A)
CITY OF DURHAM
Demonstration School

2. Appropriate methods of child care in low-income settings
3. Child rearing patterns associated with educational and intellectual development
4. Model pre-school educational patterns
5. Solid preparation of the community and region for state funded kindergartens
6. City-County school readiness screening techniques
7. Early elementary education program improvement
8. Educational program improvement at all levels
9. Development of predictors of readiness and improvement of pre-school readiness programs
10. Improvement of junior and senior high school counseling programs for community and family life
11. Introduction of new educational roles (new career opportunities)
12. Objective monitoring of new programs
13. Improved in-service and pre-service teacher training programs in the Durham public schools, at Duke University and North Carolina Central University
14. Improved coordination between schools and universities
15. Significant emphasis on an early childhood educational component in the concurrently funded OEO anti-poverty program
16. Provision of new pre-school educational techniques to private and parochial schools
17. Provision of a model system for state and national observation
18. General increase in community participation in the improvement of public schools

Components of EIP

1. The Infant Evaluation Project

A longitudinal study, covering initially 45 babies from birth to 24 months of age, began when the child was born in the Duke University Medical Center. The study provided a period of close observation and evaluation of infants prior to their entry into the EIP pre-school sequence. The short-term intensive longitudinal study was followed by a comparison of Infant Project graduates in EIP pre-schools with those not enrolled. Close attention was given to growth and learning skills of each child. Later, the personality, intellectual, and educational development of randomly selected (non-Infant Project) EIP pre-school children was compared with basic data on early development and behavior of Infant Project graduates.

In addition to providing data on the children the Infant Project served as: (1) a vehicle for the development of techniques of monitoring and measuring infant behavior; (2) a program for aiding in the development and standardization of new Bayley infant evaluation scales; (3) and a training ground for child-clinical psychology, education, child psychiatry, and pediatrics.

2. Programs for Children of Pre-School Age

Three pre-school classes were set up during academic 1965-66. The first of these, for five-year-olds in Target Area C, began with methods from traditional kindergarten practice. Later, methods based on recent research on Piaget-based curricula and behavior modification were introduced. A second group of kindergarten aged children were in the Laboratory School. This second group provided subjects for the development of behavior modification procedures to be generalized throughout the Project in subsequent years.

A program for two-year-olds was initiated in the spring of 1966 in Target Area A. The goals for children at this level were initially similar to those in traditional nursery schools. Later programs were introduced which more closely correlated with the intervention rationale developed in the Project (and discussed in detail in Chapter Two).

3. The Ungraded Primary Classes

In September 1966, the first two ungraded EIP primary classes were begun - one in Target Area C and the other at the Laboratory School. Graduates of the two 1965-66 kindergarten classes were joined by a number of six-year-olds selected by the school principals. These primary classes eventually enrolled children from the first three years of public school. This ungraded structure was individualized in the sense of engaging each child at his own developmental level regardless of the performance of others in the primary group.

The ungraded classes demonstrated the applicability of inter-age grouping and discovery pedagogy within a structured environment. Carefully articulated programs were presented in reading, mathematics, language, science, and social studies. These programs are described in Chapter Two.

Table 1 presents the start dates, ages of entry, and length of the several experimental school treatment groups during the five-year period.

4. Future Parent Program (later called the EIP Youth Program)

The youth program enrolled pupils from two junior high schools in Target Areas A and B. It had a three-fold responsibility: (1) to promote activities likely to strengthen and unify family relationships and family life; (2) to find ways to ameliorate social conditions contributing to the cycle of poverty which undermines basic foundations of healthy family life; and (3) to stimulate, by providing knowledge and appropriate supports, the desire to remain in school,

Table 1

Mean Age of Entry, Identity, and Length of Treatment of Original EIP Experimental Cohort Groups

Program Year	Calendar Year	Term	Target Area A			Target Area B		Target Area C		Lab School			Infant Proj.		No. of Groups
I	1965	Fall						5[a] (031)[b]		5 (041)					2
	1966	Spring	2 (011)												1
II	1966	Fall	3	4 (012)		2 (021)	5 (022)	6	3 (032)	6	5 (042)				8
III	1967	Fall	4	5		3	6	7	4	7	6				
	1968	Summer											2 (051)[c]		9
												6 (044)			1
IV	1968 1969	Fall Spring	5 End	6	3 (013)	4	7	8 End	5 End	8 End	7	6	3	2 (051)	13
V	1969 1970	Fall Spring	6 Follow-up	7 End	4 End	5 End	8 End	9 Follow-up	6 Follow-up	9 Follow-up	8 End	7 End	4 End	3 End	12

Note. - Length of EIP Treatment is indicated by solid vertical lines. Follow up evaluation of public school treatment is indicated by a broken line.

[a] Single numerals represent average chronological ages of children comprising each group each program year.

[b] Numerals in parentheses indicate the group identification code.

[c] Infant Project children have the same group identification number; the two groups distinguished by a status code number which indicates program year of entry to nursery school.

to achieve a higher standard of living, and to become more responsible within the family and community.

It was hoped to reach disadvantaged boys and girls two or three years before they were likely to drop out of school. The program utilized schools, churches, and existing community organizations in its effort to establish meaningful programs for target area youth. The EIP Youth curriculum focused upon three broad areas: family life education, consumer education, and vocational choice and preparation.

5. Research and Evaluation

The Research and Evaluation Component carried the responsibility for special studies, summative evaluation, recording of evidence of impact upon the local educational community, and formative evaluation for the benefit of program developers and disseminators.

Experimental/control group designs were stressed less than studies of effects on specific dependent variables within small matched groups as a function of experimental treatments. Close observation in the learning setting and concern with the learning process were emphasized more than the learned product.

The task set for the Evaluation Component was the collection of facts contributing to effective and productive program development and a better understanding of the educational process considered optimal for the Durham disadvantaged population.

Consultants in research, school psychology, nursing, social work, pediatrics, data analysis, early childhood, and elementary education provided continuous service to the research director and the program developers.

The Research Component also trained research technicians at the sub-professional level and supervised post-doctoral research fellows in child development at Duke University.

Additional demonstration, training and research functions related variously to the Durham school systems and academic departments of Duke University and North Carolina Central University.

6. Social Work

Social work in the Education Improvement Program focused upon an interpretation of the EIP program to parents, paying attention to their attitudes and motivations, with the hope of sustaining their interests in keeping their children in the program.

The social work staff (composed of trained professionals with clinical experience) adapted the traditional social work model to meet many different kinds of needs. Social work as practiced within EIP included school social work, family case work, educational supports, agency collaboration and consultation, broad social planning, and social action.

Social work included the following:

- Survey and recruitment for the several programs
- School social work, both as service and demonstration
- Consultation with EIP staff, community agencies, and school personnel
- Accumulation, classification, and quantification of data on EIP families
- Development of relationships with community resources to secure services for EIP families

7. Information

An Information Component was created in EIP to provide a variety of audiences knowledge of Project goals, procedures, methods, successes and failures, and developing activities. Personnel in the Information Office were given the responsibility of analyzing potential audiences, creating effective communication systems, monitoring the activities of the Project, and providing constant feedback to each operative component within EIP.

The Information Office was responsible for assisting in the process of dissemination of EIP activities, which included arranging for visits to the Project and interpreting programs. Tours of the Project classrooms, meetings with EIP program specialists and teachers, luncheons, week-end conferences, training programs for Ford Foundation Leadership Development Fellows, speeches at conferences, meetings with parent groups, etc, were arranged by Information Component personnel.

A series of news releases, newsletters, articles about EIP, brochures and pamphlets were produced during the period 1965-1970. These materials are listed in Appendix A.

8. Health Services

In addition to health services provided infants and mothers in the EIP Infant Project a number of services were available to all EIP families and pupils. The health condition of each pupil was monitored during the period of enrollment and suitable preventive measures were taken to control contagious diseases. Programs of health and dental care were provided in all EIP classes, conducted by an EIP registered nurse and other professionals from the Duke Medical Center. The EIP Coordinator of Medical Services worked with the Durham County Health Department to secure appropriate agency support for EIP pupils and families.

The following activities were routinely provided:

1. vision screening (and referral when needed)
2. hearing screening (and referral as needed)
3. dental screening (and referral as needed)
4. height and weight measures each semester
5. immunizations for Diptheria, Pertussis, Tetanus, Poliomyelitis, Smallpox, and Rubeola

6. daily health checks in all classrooms
7. emergency care by the EIP nurse and transportation to Duke Medical Center (all EIP pupils were insured for school connected injuries).

9. Psychological Consultation Service

A child psychologist attached to the Duke University Child Guidance Clinic was employed by EIP as a continuing consultant to the Project. When a child in EIP was not responding satisfactorily to the experimental treatments being evaluated in the Project a teacher could initiate a case conference in which all personnel in the Project who regularly came into contact with the child (teachers, aides, nurse, principal, bus driver, etc.) met with research personnel, the curriculum specialists, project director, and the consulting psychologist to discuss the progress of the child to date and possible modifications in treatment. These case conferences continued monthly until a satisfactory treatment program was worked out. In some cases, where additional resources were needed, arrangements were made as a result of these conferences to obtain medical treatment, corrective surgery, special institutional care, or individual therapy.

CHAPTER TWO

Research Strategies and Intervention Rationale

During the weeks of August 9-13 and 16-20, 1965, the nature of and direction of research and evaluation to be undertaken by the Durham Education Improvement Program was worked out by James J. Gallagher, Donald J. Stedman, and Robert L. Spaulding. The following presentation of EIP's research stance is based on James Gallagher's 1965 report.

Two major strategies were considered in detail. The first, characterized as external (or summative) evaluation, involves measures of the changes occuring in the subjects under study over the period of time they are in a treatment program. These gains are compared with those of a matched group who have not received the special treatment. A second strategy can be characterized as internal evaluation in which emphasis is on comparisons within the treated group to determine why one subject responded to treatment and another did not, and in educational research this approach places the emphasis on close observation within the learning setting and concern with the learning process rather than the learned product. Realistically, most educational evaluations represent a compromise or combination of the two strategies, but the relative emphasis placed on the two methods reveals much about the educational philosophy as well as the evaluation sophistication of research personnel.

Fig. 2 represents one acceptable model of external evaluation often used in formal evaluation. Its heritage clearly lies in the type of research often encountered in the medical-biological field. A population is accepted for study. In order to control for initial differences between the two groups, they are randomly placed in experimental and control groups. The experimental group receives the treatment (a new educational program, a curriculum innovation, counseling, etc.), while the control group receives no treatment over a comparable period. Measures are taken on relevant variables at pre-test and again, on the same measures, at standard intervals during and following treatment. As shown in Fig. 2, comparisons are then made between the relative growth of the two groups,

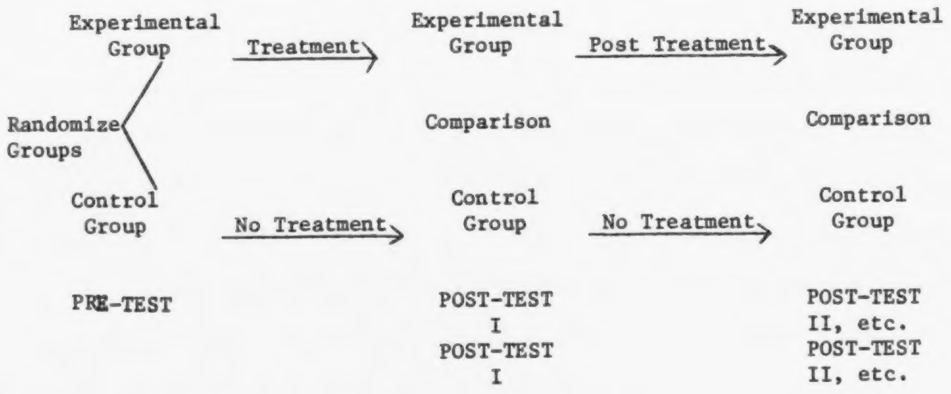
Experimental Group
Treatment
Experimental Group
Post Treatment
Experimental Group
Randomize Groups
Comparison
Comparison
Control Group
No Treatment
Control Group
No Treatment
Control Group
PRE-TEST
POST-TEST I
POST-TEST I
POST-TEST II, etc.
POST-TEST II, etc.

Fig. 2. Traditional Educational Evaluation Model.

in an effort to assess the effectiveness of the treatment. It is easy to imagine this design being used to test the effectiveness of a polio vaccine or a new cure for the common cold. In this medical evaluation there is usually the added refinement that the control group is receiving a pink pill or placebo and the experimenters themselves are unaware of who is receiving the drug and who the pink pill, to guard against the expectations of the patient or experimenter influencing the final outcome. It is hard to conceive what the educational equivalent of a placebo would be and this factor is thus rarely controlled for in educational studies. This is not the sole source of problems for this design, however.

This design has produced some valuable items of information, notably in the effectiveness of intervention in influencing IQ scores of retarded and deprived children (see reviews by Kirk, 1958; Bloom, 1964). It has been notably ineffective in changing or modifying the nature or content of educational programming. Since the major focus of the current project is in educational innovation, it is important to consider the limitations of this formal design in this respect.

The type of formal evaluation illustrated in Fig. 2, though elegant in design, possesses several crippling shortcomings for the present program. One of the most notable and important differences between the medical type of experiment and its analogous educational study lies in the nature of the treatment variable. In the medical experiment there is very little variation from one pill to another and the biochemist can tell with impressive detail the composition of the pill.

But what do we mean by educational treatment? Is it the same from one classroom to another? Is it the same from one day to the next in the same classroom? Does it not change with the nature of the group being instructed and the concept to be taught? The very nature of the "treatment" itself or of innovative techniques often seems a more proper focus for study than the outcome variables themselves. The impressive variance *between* treatment situations even among those purporting to use the same treatments (i.e., phonics, modern math, etc.), makes direct transference of this medical design questionable. The second limitation of this design also has to do with the complexity of the treatment situation and the limits of the experimenter to influence all of the pertinent variables.

Fig. 3 shows some of the potential variables that can influence student outcome, the usual measure of success or failure of the treatment applied. It is unlikely that any of these factors, by themselves, can contribute a majority

STUDENT OUTCOME——————————F (Spl, Sh, Sls, Sf, Tpl, Ts, Pv., . . . n)
(IQ scores, achievement, etc.)

Spl = Student's past learning
Sh = Student's hereditary potential
Sls = Student's set to learning
Sf = Student family environment
Tpl = Teacher's past learning
Ts = Teacher's style
Pv = Values of peer group

Fig. 3. Variables Potentially Influencing Student Outcome.

of the variance to the criterion variable. Therefore, intervention on any one of a combination of dimensions included here makes it unlikely that the experimenter, even assuming maximum efficiency for his intervention, is influencing more than half of the relevant variance at any one time. Most of the time he is influencing considerably less than that.

Intervention along any of these lines should not be expected to produce more than moderately favorable changes in student outcome since the other variables influencing the criterion variable will still be operating in a random fashion. When one combines this problem with the necessary use of small samples in many educational experiments, the chance of obtaining dramatic results for one's treatment program is slim indeed.

A third drawback to the Fig. 2 design of evaluation is that even if the treatment is recognized as successful, overcoming all of the problems noted above, the educator is still left somewhat in doubt as to which of the multitude of variables operating within the treatment situation (the classroom) might have contributed to that success. Was it the teacher's specific training background, her warmth, her style of presenting tasks that was responsible? Was it the accident that one boy who was an incorrigible irritant was, by luck of the draw, randomly placed in the control group and through his antics slowed down the educational progress of a large segment of that control group? Was it due to the happy blend of teacher personality and these particular students' personality needs that would be hard to reproduce in the future?

All of this suggests that placing exclusive reliance upon this type of external evaluation would be unwise.

In a project placing its reliance on educational innovation, the demand for imaginative thinking in the use of formative evaluation should be equally compelling.

Project Objectives and Internal Evaluation

The traditional posture of evaluators is to require of the educator some statement regarding his objectives and goals. Once these have been obtained then he can design his evaluation so as to determine how closely the particular project has come toward reaching these objectives. This approach ignores the basic fact that in many projects, particularly those focused on innovation, the objectives themselves are only dimly perceived in the beginning phases of the project. In these instances, formative evaluation can be used to help sharpen the curriculum goals. As Cronbach (1963) commented:

> Evaluation is a fundamental part of curriculum development, not an appendage. Its job is to collect facts the course developer can and will use to do a better job, and facts from which a deeper understanding of the educational process will emerge.

The objectives regarding children in the Durham EIP seemed to fit into two major dimensions. First, there would be the desire to help children from disadvantaged circumstances develop conceptual schema or systems which would allow them to assimilate and organize effectively the barrage of information coming through their senses every day. Second, it was to aid such children develop habits which would add up to appropriate learning sets, to help them become ready and willing to learn more about the world around them, to seek information rather than passively have it poured over them like syrup on a leathery pancake. A series of special studies investigating the effects of short-term specific treatments designed to reach these goals was planned as a major research strategy.

External Evaluation

The persistent difficulties with external evaluation charted out above do not release educational researchers from responsibility for carrying out some type of summative evaluation so that long-term changes in treatment groups and comparison samples can be charted. However, choices had to be made in terms of the best utilization of limited time and personnel resources and it seemed the greater payoff in the Durham project lay in the direction of internal evaluation.

Sample Selection for External Evaluation

Once criteria were established regarding the children to be studied, the selection of comparison groups that would provide benchmarks for the growth of the children under special educational treatment became important. By far the most desirable approach would have been to place all eligible children (i.e., those possessing all necessary characteristics to be admitted to the program) in a selection pool. To the extent possible this approach was taken. A group much larger than the EIP treatment programs could enroll was identified in each Target Area. Several groups of children who were to receive special educational experiences were chosen by random number with the remainder of the original list serving as a comparison group from which random samples were to be drawn five years later. The great advantage of the random selection procedure was that it allowed comparison of samples on the dependent variables without the necessity of a pre-test since the assumption could be made that the samples were equal at the time of selection (Campbell and Stanley in Gage, 1963).

Another approach employed, especially in short-range studies, was the use of the subject as his own control. That is, baseline performances of the children on tasks such as coping with an instructional setting were established; then specific treatments, such as a specific instructional or teacher behavior sequence, were introduced. A series of observations following such educational interventions then compared the individual against himself to see the influence of specific treatment programs. Many such special studies were undertaken in EIP and are reported in Volume III of this report.

A point not settled in the 1965 discussions was the degree to which the group of Durham children picked for the educational treatment possessed some generalizability to a larger sample. If this group were found not representative of some larger sample of children, then the longitudinal results and comparisons with other groups would have dubious application. A compromise was made between the experimental group membership for special study purposes and membership to satisfy longitudinal research goals. For instance, one group of children recruited from Target Area D presented an overall portrait of emotional disturbance and severe language restriction. This group proved to be a threat to the integrity of the treatment model and the emotional stability of the instructional staff. An extraordinary effort was made to try to retain this sample in the Laboratory School (even though they were markedly atypical) since the treatment model was being tested under severe conditions. This decision was based on the assumption that internal studies and measures of treatment effects under such severe conditions were such potent sources of information that generalizability from Target Area D data could be sacrificed.

Measuring Instruments for Summative Evaluation

Early in the Project, when logistics had not yet become a sizable burden, there was a tendency to throw into the fall and spring testing battery, a large number of "interesting" measures. This tendency was resisted to some extent. Instruments from which a definable result could be foreseen were considered. Costs in terms of personnel for handling the longitudinal data were heavy, especially during the fifth year. To ease this burden an "educational technician" program was developed to provide staffing for the heavy fall and spring general evaluations.

The Stanford-Binet (Form L) was chosen as an index of longitudinal intellectual development. The Stanford-Binet could be applied through the entire age range of EIP educational interventions. The Bayley Scale of Infant Development was used with infants during the period from birth through 24 months, prior to enrollment of Infant Project graduates in the educational sequence.

The Coping Analysis Schedule for Educational Settings (CASES) (Spaulding, 1968) was used once every spring from May 1967 through May 1970 to obtain group data on socialization. This was an important phase of evaluation since many of the goals of the several interventions were in the area of social development and changes were measurable solely by CASES.

Other instruments such as the Wechsler Intelligence Scale for Children (WISC), the Wechsler Preschool and Primary Scale of Intelligence (WPPSI), the Illinois Test of Psycholinguistic Abilities (ITPA), the Peabody Picture Vocabulary Test (PPVT), and the Preschool Attainment Record (PAR) were used for special longitudinal studies using sub-samples of the total EIP population. In the primary school programs the Metropolitan Achievement Test (MAT) was chosen as a measure of academic achievement.

Instruments and Methods Used in Internal Evaluation

The fundamental purpose of internal evaluation was to observe closely circumscribed sets of behavior of the children in a specific learning situation concomitant with the introduction of a well defined set of instructional materials and procedures. In most instances, it was possible to determine the baseline behavior of each child by observing him in standard settings or criterion tasks prior to educational intervention. In other studies, evaluation of process variables was done by making daily observations using CASES before, during, and following specific experimental treatments. Measurement and modification of teacher behavior variables to effect desired treatments was accomplished using portions of the Spaulding Teacher Activity Rating Schedule (STARS)(Spaulding, 1968).

Selection of Subjects in Special Studies

The selection of subjects for the series of internal evaluation studies did not rely upon representativeness of sample so much as upon educational criteria since comparisons were made either with each child's own behavior or with other members of the group. It was important to obtain as much descriptive information as possible on each of the subjects so that estimates could be made as to why certain children responded to some kinds of educational intervention and others did not. Interviews with family members, systematic observation in school settings, and ratings by teachers and social workers provided the bulk of case study material. Since the variety of variables that could play a role in student learning is impressively large (see Fig. 3), the case study approach permitted the identification of particular constellations or combinations of factors, present in individual children, which appeared to be particularly relevant in specific instances of learning and failure to learn. These case studies became an important aspect of the evaluation program.

Intervention Rationale

Classroom Learning as Transaction

Gardner Murphy (1947) referred to personality as a "node or region of relative concentration in a field of vast and complex interpenetrating forces, in which none of us is completely individualized any more than he is completely washed out in a cosmic sink of impersonality." Just as an organism may be looked upon as a "node" in a force-field, a group of persons functionally related for an extended period of time in spatial proximity may be viewed in the same way. The elementary or pre-school classroom is a force-field and a transactional view of the complex interpenetrating forces which operate there is provocative and instructive.

In contrast to the concept of the "interaction" of teacher and pupil, transactional conceptions lead away from concern with object and products and center attention on process.

The transactional view involves more than a change of terminology. It is a difficult concept to achieve since, as Dewey and Bentley (1949) have shown, it requires the jettisoning of self-actional and interactional concepts borrowed from Newtonian physics and supported by an extensive literature and practice in stimulus-response psychology.

"Minding" as another name for "attending" is consistent with a transactional approach. What is "attended" to becomes incorporated into the organismic/environmental transaction. The writings of Ashby (1960) and Taylor (1962) have extended the transactional view, with Taylor making a specific application to the field of child development. Taylor's behavior theories of perception, adaptation, and consciousness are consistent with Ashby's hypothetico-deductive "design for a brain," Piaget's stages of intellectual development, and traditional concepts of conditioning (both classical and operant). From these theorists, among others (notably Bandura), an intervention rationale in EIP was developed. It is best expressed, perhaps, as a set of basic assumptions.

Basic Definitions and Assumptions in EIP Regarding Learning

1. Intelligence is defined as "minding." Minding is understood as "responding appropriately in a given setting" as in, "She is minding the baby."
2. "Minding" is paying attention to the relationships of figure and ground and responding appropriately to maintain variances within desired limits. In the case of "minding the baby" it means watching and listening for signs of distress (or danger from the environment) and the taking of necessary steps to protect and care for the welfare of the baby.
3. What one "attends to" structures his "minding" capabilities. For example, watching a person's eyes provides information regarding his interests, concerns, perceptions, and knowledge.
4. Intelligence in a child is the cumulative appropriate responsiveness to increasing complex figure/ground relationships. It is dependent upon the child's active commerce with the physical and social environment. To act with intelligence is to respond "appropriately" in specific situations.
5. The quality of the commerce (with the environment) is a function of a child's attainments in prior commerce (stored as residual, qualitative, responsive characteristics of cognitive structure) and the stability (or "ultra-stability" in Ashby's terms) of such attainments in the responsive neural systems of the attending child.

6. The "quality" of the cognitive commerce is understood in terms of both the complexity of the invariances abstracted and stored through ultra-stable cognitive/environmental force-fields and the degree to which the stored invariances function in adapting the child to the dominant culture.
7. The direction and rate of development of minding (intelligence) can be influenced by structuring the child's physical and social environment to activate specific attending and manipulative responses. This structuring in EIP took the form of:
   a. discovery pedagogy and direct tuition in non-social learning, and
   b. behavior modification in social learning.
8. At any one time each child in the school setting is assumed to be operating with a repertoire of responsive systems which have been found useful by the child in past physical and social commerce. These ultra-stable response systems can be observed in social and physical settings in the school when the array of environmental forces particular to each are operative.
9. New response systems (coping behaviors) can be "taught" by structuring the school environment (socially and physically) to activate a re-alignment of forces in the organismic/environmental transaction (Ashby's "adaptation" and Piaget's balance of "assimilation" and "accommodation"). Note: The concept of "coping" in EIP was used as a generic term to refer to persistent response patterns displayed by children in the social settings of the school. It was intended to be correlative to Ashby's concept of "ultra-stable" response systems.

10. Well established coping behaviors can be eclipsed by structuring the school environment to preclude the operation of a particular social force which has been operating to trigger inappropriate response patterns (extinction of maladaptive social behavior).
11. Ultra-stable response systems involving social forces can best be modified by restructuring the social environment, including affective dimensions (i.e., by means of the systematic application and withholding of positive or negative affect, etc.)
12. Ultra-stable non-social, cognitive systems involving physical forces (objects, signs, symbols, etc.) can best be modified by excluding or minimizing the affective dimensions of the social forces present in the child's environment. That is, the achievement of more complex (higher-order) cognitive adaptations (perceptions of invariances within variable force-fields) is assumed to be facilitated by eliminating non-critical, distractive social forces.
13. The language of the learner functions through a process of conditioning (Taylor, 1962) to operate (as environment) on sensory process, mediating perception. As a result of the child's increasing complexity of language, his perception is enhanced and shaped. In EIP the activation of speech during "minding" was also assumed to be productive of an increased accuracy of perception since consensual validation becomes possible only through language. Talking about perceptions while learning was, therefore, not only permitted in EIP but encouraged.
14. "Play" in EIP was interpreted as the child's experimental manipulation of variables in the social and physical force-field (under the control of the child). It is assumed to be the necessary process by which a child

tests (through his control over variance in feedback) the stability (or lack of stability) of a particular set of forces in a given force-field. It is correlative to the process of discovering object or dimensional permanence (conservation of objects, length, volume, etc.) in Piaget's terms.

15. "Teaching" in EIP was defined as the planned structuring of the child's external environment with the intention of changing the quality, direction, and rate of development of cognitive and social adaptation. Teaching, therefore, focused upon the control of specific variables entering into desired social and cognitive response systems.

16. Teaching, from this point of view, involves strategies regarding the selection and introduction of physical objects, signs, and symbols and the experimental introduction of types of social forces. The pedagogy of "discovery" learning is fundamental to this process and EIP programs were intended to maximize the effective use of discovery methodologies in teaching subject-matter in structured fields of knowledge. (The discovery methods described by Morine and Morine [1970] formed the basis for EIP teacher training workshops in 1965 and 1966.) Telling and showing were used in non-logical (non-structured) fields of knowledge and in motor training.

17. The EIP child's learning was assumed to become most permanent and functional when it was achieved under his control. That is, adaptive systems in pupils resulting from perceptions of relevant system variables (as distinguished from non-functional environmental parameters such as teacher affect in a mathematics task or a symbol decoding problem) were assumed to have long-term utility in future adaptations in more

complex environments. In contrast, cognitive adaptations achieved in response to direct instruction in logically structured content areas, where specific child responses are elicited through direct social forces (threat, coercion, praise, command, etc.) are assumed to be setting-specific, to have short-term utility, and become increasingly less useful to the child (in adapting to more complex environments) as time passes. That is, response capabilities shaped by direct tuition are expected to have little long-term transfer value. As a consequence of the several related assumptions presented above and the adoption of instructional strategies based upon them, EIP subjects were expected to perform poorly on standardized (MAT) achievement tests until the third or fourth "grade" when problem-solving capabilities were more likely to be sampled by the items on the test.

Assumptions Regarding the Design of Programs

Researchers in the Durham EIP intended to discover the means to make it possible for Durham's socially and economically disadvantaged children to respond successfully to the demands made upon them by the local public schools. EIP personnel undertook not only to improve the intellectual and academic performance of these children, but also their social skills, and their ability to cope successfully with adult authorities. (This approach which might be called "survival training," was taken as the only feasible one. The schools these children now attend, after leaving EIP, are graded and the demands made upon them, as well as all children in the public schools, are based on grade standards rather than the differential learning and developmental characteristics of pupils.)

Children from local poverty environments apparently suffer a variety of insults which tend to produce either apathetic or aggressive attitudes. Programs designed by EIP were structured to counteract these tendencies by enhancing self-esteem and encouraging each child to derive self-control and a measure of productive autonomy. A definite goal was to promote responsible, cooperative independence by means of carefully designed classroom socialization procedures. Through the development of internal controls and the opportunity to experience respect from others, EIP children were expected to gain self respect.

The Durham child was expected to be able to learn two sets of adaptive responses - those appropriate at home, and those suitable to school. Initially, EIP teachers experimented with food and extrinsic reinforcers such as tokens to increase the frequency of desired behaviors. Later, symbols such as "stars" and, eventually, words with positive valence were used as external reinforcers. Internal or self-reinforcement was encouraged by the giving of choice and freedom as a function of the emergence of reliable social skills. Academic skills which are valued and reinforced in both the school and home cultures (for example, skills of reading and mathematics) were first strengthened by teacher distributed external reinforcers. When these academic skills were sufficiently reinforced by parents, friends, and other social agents in the natural environment the use of external reinforcers by EIP teachers was attenuated. Eventually, self-reinforcement was expected to become more operative and sustain appropriate adaptive behavior in the public schools.

Coping Styles

EIP's programs as developed over time were based on the assumption that children in the EIP sample were physiologically normal at birth, even though subjected to conditions which jeopardized their physical and emotional health. It was assumed that they could adapt to their environment according to the same laws of learning that apply to all normal children (in whatever terms such learning processes might be described).

Durham's disadvantaged children (both white and black) are apparently raised in environments which reinforce many operants which are generally less favored in middle-class families and the public schools. The "hidden curriculum" of the home and street seems to favor peer orientation and adult avoidance. These "coping styles" of children can be measured by observing them in social settings using the Coping Analysis Schedule for Educational Settings (CASES). Adult reward systems in Durham's low-income families were assumed to foster both passive and active resistance to adults, withdrawal in the face of physical threat, and a cautious approach to strange social settings. Peer reward systems apparently foster various forms of peer orientation including cooperation, submissiveness to ascendant peers, domination of non-aggressive peers, passive aggression directed against coercive or impersonal authority, and adult avoidance.

Teacher punishment techniques in conventional classes in Durham appear to operate to suppress school-inappropriate behavior and teacher reward seems to be insufficient or not well timed enough to strengthen adequately the appropriate, cooperative and conforming, or independent, productive coping styles in disadvantaged children. Instead, apparently, passive avoidant styles are strengthened and cognitive adaptation is inadvertently reduced. Early childhood teachers of disadvantaged children generally obtain control by punishing inappropriate behaviors (Meyer, 1969) and in so doing eliminate also those exploratory operants necessary for learning the external and internal consequences of motor, social, and cognitive acts occurring in the classroom environment. Punishment, also, appears to suppress a child's active attending to relevant setting events which could operate to cue appropriate adaptive, cognitive, social, and motor acts.

The factors and hypothesized relationships outlined above were assumed to be some of the reasons why primary classrooms in Durham's low-income areas are characteristically quiet and the children passive, subdued, watchful of adults, and detached from an active process of learning.

It was assumed that rote learning and the practice of routine motor skills in submissive conformity in such classes would most likely lead to assimilation of specific algorithms and that this type of learning would fail to permit the day-by-day accommodation of existing cognitive structures to relevant variables in increasing complex educational settings. Accommodation was assumed to require an active processing by the learner of sequenced information making use of haptic, kinesthetic and linguistic, as well as visual and auditory inputs under the control of the learner. Without opportunity for active pupil self-control over variation in sensation, the discrimination of environmental invariances was assumed to be prevented or retarded.

However, since coping behaviors appropriate to the discrimination of cognitive invariances have apparently not been strengthened by the "hidden curriculum" of the home and street, the elimination of teacher punishment in the school was expected, initially, to result not in cooperative and productive academic inquiry but in the continued and enhanced expression of peer oriented attention-getting behavior, aggressiveness, avoidance of adults, hyperactivity, and in some instances withdrawal.

Classroom Strategy and Treatment Programs

Since inappropriate behavior styles (as well as some appropriate styles) are shaped early by a child's environment, EIP's earliest interventions were set for children two years old.

We attempted to establish a structured environment - structured in the sense of prearranged concrete materials and specific teacher behavior (verbal and motor) to be expressed following specific behaviors displayed by the children.

In addition, we planned specific reinforcers to be presented contingent upon the appearance in pupils of appropriate modeling behavior and the productive manipulation of the physical environment. Objects to be manipulated were to be systematically introduced by adults and when they were handled and talked about in a desirable way by the pupils, appropriate food or social reinforcers were to be given. Social reinforcers proved to be most effective in this process and were used most commonly.

The careful structuring of the physical environment as well as the deliberate scheduling of reinforcements was intended to result in self-control of impulse, productive manipulation of objects, and increased verbal communication. Inappropriate coping styles brought to the classroom were expected to be eclipsed in favor of learning sets and behaviors favored by the local public schools and the Durham middle class generally.

EIP teachers were trained to program stimulus events differentially for each type of child they encountered in their classes. By means of a coping analysis schedule (Table 2), the operant styles of children were identified and teachers were taught to prepare treatment programs which would apply to several children of one type and were not expected, on their own, to discover or invent treatment programs appropriate for each child. A generalized treatment program was devised to correlate with categories of the coping analysis schedule and assumptions from the behavior theory outlined earlier (Tables 2 and 3). This generalized treatment program outlined treatment with regard to "desirable," "inappropriate," and "unacceptable" behavior. Since what was "desirable" or "inappropriate" for one child was not necessarily the same as what was regarded as "desirable" or "inappropriate" for another child, special treatment programs by type of child were needed.

The individualized treatment schedules were derived from the Coping Analysis Schedule for Educational Settings (CASES) and are presented in Tables 4 through 9. By means of remote prompting, teachers and teacher aides were taught to carry out these specific, individualized, reinforcement schedules to modify particularly disturbing social behavior patterns. These treatments did not require teachers and aides to depart from their general subject-matter programming for groups of children when responding to idiosyncratic pupil behavior.

Behavioral Goals

Each of the specialized treatments presented in Tables 4 through 9 were designed to strengthen desirable behavior and weaken undesirable behavior. Six Styles of coping were anticipated by these treatment schedules. The six Styles and corresponding treatments were defined empirically in previous research (Spaulding, 1968) and applied experimentally in the current Project.

The behavioral goals of this phase of the Project were defined as Style E behavior (obedient, conforming) in teacher directed settings and Style F behavior (independent, productive, assertive) in all other instructional or academic settings. Style D (peer oriented, gregarious) or Style F (independent, productive, assertive) behaviors were objectives in non-instructional or non-programmed (free) settings in the Project schools. Criterion behavior percentages for each Style were set by observing the types, rates, and amounts of behavior emitted by children nominated by teachers as representative of each of the six behavior Styles. The Style descriptions, defining CASES categories, and critical percentages of behavior for each Style are summarized in Table 10. A preferred Style

Table 2

A Coping Analysis Schedule for Educational Settings (CASES)*
(Brief Form for Quick Reference)

1. Aggressive Behavior:

   Direct attack: grabbing, pushing, hitting, pulling, kicking, namecalling; destroying property: smashing, tearing, breaking.

2. Negative (Inappropriate) Attention-Getting Behavior:

   Annoying, bothering, whining, loud talking (unnecessarily), attention-getting aversive noise-making, belittling, criticizing.

3. Manipulating, Controlling, and Directing Others:

   Manipulating, bossing, commanding, directing, enforcing rules, conniving, wheedling, controlling.

4. Resisting Authority:

   Resisting, delaying; passive aggressive behavior; pretending to conform, conforming to the letter but not the spirit; defensive checking.

5. Self-Directed Activity:

   Productive working; reading, writing, constructing with interest; self-directed dramatic play (with high involvement).

6. Paying Close Attention; Thinking, Pondering

   Listening attentively, watching carefully; concentrating on a story being told, a film being watched, a record played; thinking, pondering, reflecting.

7. Integrative Sharing and Helping:

   Contributing ideas, interests, materials, helping; responding by showing feelings (laughing, smiling, etc.) in audience situations; initiating conversation.

8. Integrative Social Interaction:

   Mutual give and take, cooperative behavior, integrative social behavior; studying or working together where participants are on a par.

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Table 2 (continued)

9. Integrative Seeking and Receiving Support, Assistance and Information:

   Bidding or asking teachers or significant peers for help, support, sympathy, affection, etc., being helped; receiving assistance.

10. Following directions passively and submissively:

    Doing assigned work without enthusiasm or great interest; submitting to requests; answering directed questions; waiting for instructions as directed.

11. Observing Passively:

    Visual wandering with short fixations; watching others work; checking on noises or movements; checking on activities of adults or peers.

12. Responding to Internal Stimuli:

    Daydreaming; sleeping; rocking or fidgeting; (not in transaction with external stimuli).

13. Physical Withdrawal or Passive Avoidance:

    Moving away; hiding: Avoiding transactions by movement away or around; physical wandering avoiding involvement in activities.

NOTE: Categories 3, 5, 7, 8, and 9 are further coded as a or b in structured settings to indicate appropriate or inappropriate timing or location of activity (based on the teacher's expectations for the setting). Example: 5a would be recorded when a child was painting during art period (when painting was one of the expected activities). Painting during "story time" or in an academic setting would normally be coded 5b. The code a represents behaving in a certain coping category at the "right" time and place; b represents behaving in a certain coping category at the "wrong" time or place. What is "right" or "wrong" is based on the values and goals of the teacher or authority responsible in a given situation.

A child might be sharing with another child in an integrative manner (7) some bit of information the teacher regarded as highly inappropriate. It would be coded as 7b since it was an integrative act of sharing occurring at the "wrong" time in the "wrong" place, from the point of view of the teacher.

Table 3

Generalized Treatment Schedule

TYPE OF SOCIAL BEHAVIOR

Unacceptable	Inappropriate	Desirable
W	R	
Use time-out of the social setting to suppress unacceptable behavior. Do not negotiate. Do not condemn. Move the pupil out of the social setting with a minimum of attention. (Use "time-out" periods of 3 to 5 minutes each time.)	Ignore all behavior of this type (to extinguish it). (It will disappear very slowly as newly emerging behaviors are strengthened.)	Reinforce newly emerging desirable behavior. Upon return from "time-out" count to 15 or 20 and then reinforce the first desirable behavior that occurs. Describe in words the act that is being approved. Circulate from pupil to pupil to reinforce on a random interval schedule the established desirable behavior of every pupil.

Note: Arrows indicate change from one type of behavior to another.

W = Withhold all social reinforcement ("time-out" from reinforcement)
R = Reinforce

Table 4

Style A

Aggressive

Annoying, bothering

Dominative, controlling

Resistant

CASES 1, 2, 3b, 4

Behavior frequencies of 3% or more in these categories in any social setting in the school identify a pupil of this type (assuming repeated observation over several days or weeks).

Treatment Schedule[1]

1. Set strict, narrow limits (set specific routine to follow), Give no choices, set specific concrete academic tasks.
2. Assign to specific work station (to work alone).
3. Instruct individually or in groups of six or fewer.
4. Supervise closely (do not leave child unattended).
5. Punish all unacceptable behavior immediately by social isolation (time-out from reinforcement).
6. Reinforce all emerging desirable behavior (100% schedule).
7. Ignore visual wandering (11) and daydreaming (12).

Special CASES Classification and Treatment
(For Style A)

Isolate	Ignore	Reinforce
CASES 1, 2, 3b, 4, 5b, 7b, 8b	CASES 11, 12, 13	CASES 3a, 5a, 6, 7a, 8a, 9a, 10

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[1] CAUTION: Discontinue treatment when Style A behavior remains below 3% in all social settings for 10 days. Shift to Style B treatment schedule.

Table 5

Style B

Style B	CASES 4, 5b, 2
Passive aggressive, resistant Delaying, sullen, hostile Watchful, cautious	Behavior frequencies of 10% or more in these categories in any social setting in the school identify a pupil of this type (assuming repeated observation over several days or weeks).

NOTE: A child may exhibit this style without ever having learned integrative, cooperative, or conforming behaviors. Or he may have become hostile and resistant in a punitive or dominative environment after having been fully socialized in a more benign environment. Treatment will differ depending on these two differential histories (see reference 2 at bottom of page for treatment of unsocialized pupils).

Treatment Schedule[1]

(Assuming child was once socialized)

1. Set relatively broad limits (do not set a strict routine). Provide many choices in terms of conditions and circumstances of work and task undertaken.

2. Permit child to select his own work station and rate of work.

3. Use indirect teaching techniques, avoid direct commands or confrontations.

4. Do not supervise closely but remain nearby to reinforce appropriate behavior by giving novel material to use or responsibilities commensurate with task performance.

5. Ignore resistance and delay[2] but punish (by isolation) any active aggression (1) or domination (2, 3b).

6. Reinforce all emerging task oriented, productive behavior with increments of freedom. tokens, or privileges (avoid social approval).

7. Ignore dependent, submissive, and passive conformity.

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[1] CAUTION: Discontinue treatment when Style B behavior remains below 10% in all settings for 10 days. Shift to Style E treatment schedule.

[2] Punish resistance and delay (4) by isolation and reinforce conformity (10a) if Style B behavior remains above 10% 20 days after treatment is begun. The assumption here is that the pupil has never been fully socialized and delaying tactics must be eliminated to permit new, more appropriate operants to occur and be reinforced.

Table 5 (continued)

Special CASES Classification and Treatment
(For Style B)

Isolate	Ignore	Reinforce
CASES *1*, *2*	CASES *3b*, *4*, *5b*, *7b*, *8b*, *9a*, *9b*, *10*, *11*, *12*, *13*	CASES *3a*, *5a*, *6*, *7a*, *8a*

NOTE: If the pattern of resistance and delay (4) persists (remains above 10% after 20 days of treatment) use the following treatment:

Isolate	Ignore	Reinforce
CASES *1*, *2*, *4*, *5b*	CASES *3b*, *7b*, *8b*, *9a*, *9b*, *11*, *12*, *13*	CASES *3a*, *5a*, *6*, *7a*, *8a*, *10*

Table 6

Style C

Dependent	CASES 9b, 11, 12, 13
Passive, withdrawn	Behavior frequencies of 15% or more in these categories in any social setting in the school identify a pupil of this type (assuming repeated observation over several days or weeks.)
Fearful, watchful, distractable	
Avoidant	

Treatment Schedule

1. Set narrow, clearly defined limits (set specific routines). Give no academic choices; set specific, concrete academic tasks; provide structure at all times.
2. Assign to specific work station near supportive peers.
3. Instruct individually or in groups of six or fewer.
4. Stay nearby to provide structure and support.
5. Do not punish; ignore aggressive behavior (if it occurs).
6. Reinforce all emerging active, pro-social or productive behavior.
7. Ignore anti-social aggressive, withdrawn, or dependent behavior.

Special CASES Classification and Treatment
(For Style C)

Isolate	Ignore	Reinforce
(Do not punish unless CASES 1 and 2 rise above 5% in any setting)	CASES 1, 2, 3b, 4, 5b, 7b, 8b, 9b, 10, 11, 12, 13	CASES 3a, 5a, 6, 7a, 8a, 9a

NOTE: Discontinue treatment when Style C behavior remains below 10% in all social settings for 10 days. Shift to Style E treatment schedule.

Table 7

Style D

Talkative, social

Gregarious

Peer dependent

CASES 7b, 8b, 9b, 11

Behavior frequencies of 15% or more in these categories in any academic or instructional setting identify a pupil of this type (excluding free social settings and assuming repeated observation over several days or weeks).

Treatment Schedule

1. Set narrow, clearly defined limits (set specific routines). Provide no choices involving interaction; gradually increase choices among concrete academic tasks.
2. Assign to specific work station.
3. Instruct in groups of six to ten.
4. Stay nearby to apply reinforcements (and sanctions).
5. Punish unacceptable behavior by social isolation (after verbal cautioning).
6. Reinforce all emerging desirable behavior.
7. Ignore teacher-dependent behavior.

Special CASES Classification and Treatment
(For Style D)

Isolate	Ignore	Reinforce
CASES 1, 2, 3b	CASES 4, 5b, 7b, 8b, 9b, 11, 12, 13	CASES 3a, 5a, 6, 7a, 8a, 9a, 10

NOTE: Discontinue treatment when Style D behavior remains below 10% in all academic or instructional settings for 10 days. Shift to Style E treatment schedule.

Table 8

Style E

Obedient, docile, submissive

Compliant, dependable

Studious, conforming

CASES 5a, 7a, 10, 9a

Behavior frequencies of 80% or more in these categories summed over all school settings including non-teacher directed settings identify a pupil of this type.

Treatment Schedule

1. Set relatively broad limits. Permit many academic and social choices, both in terms of conditions and circumstances of work but also the task to be undertaken.

2. Permit and encourage child to select his own work station and companions.

3. Instruct in medium sized groups (10-12 persons) when introducing new concepts or skills (use direct, expository instruction for new skills and indirect, structured discovery techniques for new concepts).

4. Do not supervise closely, but return periodically to reinforce productivity, innovation, independence, and choices.

5. Withdraw freedom to make academic and social choices as necessary as punishment (restore freedom after an appropriate time).

6. Reinforce all emerging task oriented academic and social behavior (5a, 6, 7a, 8a). Ignore conformity (10).

7. Ignore minor disturbances (2) and minor inappropriate independent or social interaction (3b, 5b, 7b, and 8b).

Special CASES Classification and Treatment
(For Style E)

Isolate	Ignore	Reinforce
CASES 1, 2 (above 3%)	CASES 3b, 4, 5b, 7b, 8b, 9b, 10, 11, 12, 13	CASES 3a, 5a, 6, 7a, 8a, 9a

NOTE: Treatment for Style E designed to produce Style F behavior.

Table 9

Style F

Independent	CASES 3a, 5a, 6, 7a, 8a
Productive	Behavior frequencies of 85% or more in these categories summed over all school settings involving cognitive stimulation, concrete content, and a high degree of choice identify a pupil of this type. (When severely constrained a pupil may appear as Style B or Style E.)
Responsible	
Assertive	
Integrative	
Thoughtful	

Treatment Schedule

1. Set very broad limits. Permit wide latitude for academic and social choices.

2. Permit and encourage child to select own task, work station, task procedures, and companions.

3. Do not instruct directly. Set academic goals in terms of parameters of problems to be solved. Provide structure as needed to foster discovery of concepts, principles, and generalizations.

4. Do not supervise. Schedule periodic seminars or conferences to review activities and results of effort.

5. Increase structure when anxiety or frustration occurs - i.e., provide guidelines as needed but do not direct.

6. Reinforce cognitive analysis, conceptualization, generalization of principles, evaluation, and application of principles (or new skills when appropriate).

7. Ignore minor inappropriate use of time and/or materials. Ignore minor inappropriate social interactions, dependency, and conformity.

NOTE: The special CASES classification and treatment for Style F is the same as that for Style E (Table 8).

Table 10

CASES Styles, Descriptions, CASES Categories Defining Each Style, and Critical Percentages Which Indicate Preferred Style

Style	Descriptions	CASES Categories	Critical Percentages
A	Aggressive, abusive	1	3% or more in any school or classroom setting
	Annoying, bothering	2	
	Dominative, controlling	3b	
	Resistant	4	
B	Passive aggressive	2	10% or more in any school or classroom setting
	Watchful, cautious, resistant	4	
	Delaying, sullen, hostile	4	
	Self-centered, independent	5b	
C	Dependent	9b	15% or more in any school or classroom setting
	Passive, withdrawn	12	
	Fearful, watchful, distractable	11	
	Avoidant	13	
D	Talkative, social	8b	15% or more in any school or classroom setting (excluding free social settings)
	Gregarious	7b	
	Peer dependent	9b, 11	
E	Obedient, docile, submissive	5a	80% or more in all school or classroom settings
	Compliant, dependable	7a	
	Studious, conforming	10, 9a	
F	Independent-productive, assertive	5a	85% or more in all school or classroom settings
	Integrative, socially adept	3a, 8a	
	Thoughtful	6	
	Responsible, dependable	7a	

Note: Style E and Style F behavior will not be easily distinguished in highly teacher-directed settings. Pupils must be observed in settings involving a high degree of cognitive stimulation, concrete (as well as formal) content, and social and academic choice to distinguish those who can produce (and apparently prefer) Style F behavior. When pupils who prefer Style F behavior are severely constrained they may prefer Style B behavior over Style E.

can be determined by sampling behavior in relatively free or unsupervised academic settings as well as highly directed ones.

The several treatments outlined for each Style were designed to produce, eventually, Style E and/or Style F behavior as appropriate to the goals, limits, and conditions set by social agents of the school (teachers, aides, specialists, etc.).

Methods of Suppressing Undesirable Behavior and Strengthening Desirable Behavior

A major problem was faced when teachers were asked to avoid aversive stimulation as a means of suppressing undesirable behavior. They tended to adopt a laissez-faire approach, abandoning limit and goal setting as well as punishment. They also failed, initially, to immediately increase attention to desirable operants, leaving it to pupils to search for intrinsically satisfying activities or actions which would successfully provoke or arouse the attention of others.

The difference between indirect control through structure - that is, through a prearrangement of the stimulus setting, differential limit and goal setting, the selective introduction of materials to stimulate articulated pupil exploration and productive behavior, and the use of increased attention to existing desirable behavior to strengthen profitable activities - in contrast to direct control through aversive stimulation contingent upon undesirable behavior is a confusing one. The presence of a high degree of aversive stimulation by EIP teachers was assumed to be counter productive. However, this assumption did not avoid the necessity of using some form of punishment to suppress certain unacceptable (dangerous, severely destructive, or extremely disturbing) behavior.

Punishment, therefore, was achieved by withholding reinforcers. Children were assumed to be conditioned to attend to setting cues by their discovering consistent relationships between adult verbal limit-setting, their acts of moving beyond verbally designated limits, and the immediately consequent presence or absence (or withdrawal) of reinforcers. High teacher consistency in presenting or withholding reinforcers, rather than use of negative affect, was believed to be most useful in assisting a child learn new coping styles. This assumption is supported by Bandura's (1963) studies of the effects of aversive punishment.

Whenever it was possible - that is, when self-reinforcers were already operative - limits and goals for cognitive operations by EIP pupils were set without scheduling increased external reinforcement. In line with assumptions from behavioral theory outlined in a previous section, affectively neutral attending behavior on the teacher's part was expected to encourage children to disregard teacher affect and mood and attend to non-social setting cues and internal, cognitive criteria. The ability of a teacher to cause a child to utilize internal (cognitive) criteria to judge the appropriateness of a cognitive operation (instead of teacher or peer affect) was assumed to lead the child to a better balance between assimilation and accommodation. The child could then be led to generalize from the specific cognitive dimensions of the setting in which a concept was developed and adapt more readily to a variety of subsequent, related, cognitive demands.

EIP teachers were requested, therefore, to make use of positive reinforcement (and "time-out" from positive reinforcement) to control or modify social, motor behavior, and attending behavior rather than to use social reinforcers to modify cognition. Children were encouraged to classify and reclassify concrete objects along specific dimensions requested by the teacher, assuming that they would utilize their own (internal) criteria if external aversive and/or reinforcing social stimuli did not intrude.

Teachers were also expected to maximize the proportion of time they spent in setting and resetting cognitive tasks (pacing these cognitive demands appropriately) and minimize direct verbal presentations of concepts and generalizations. They were encouraged to minimize the amount of time spent in classroom management and logistics. With teachers expected to apply complex individual behavior treatments and individualized or small group instruction it was necessary, as well, for each team of EIP teachers to develop its own daily schedule and management system. These new skills and understandings took time to master and it was not until the fourth or fifth year of the Project that most EIP teachers were thoroughly familiar with, and skillful in applying, the experimental treatments.

Applying the Treatment Schedules Based on CASES

In teaching EIP personnel to apply the general treatment schedule (Table 3) it was found important to focus teacher attention on strengthening emerging, desirable pupil behavior rather than encourage them to persist in trying to weaken inappropriate or undesirable pupil activities. The most economical pupil behavior control procedure (in terms of long-term effects) was found to be a process of preempting the time a pupil had available for inappropriate (or unacceptable) actions by strengthening all of his desirable academic and social actions regardless of the degree to which they measured up to age or grade expectations.

The generalized treatment schedule was developed (Table 3) which called for "time-out" from social reinforcement rather than aversive punishment to weaken unacceptable social behavior. The rationale for this came from the literature on social learning and behavior modification (Bandura and Walters, 1963; Becker, Thomas, and Carnine, 1969). The following procedure for using "time-out" as an emergency punishing technique was worked out in the EIP Laboratory School and generalized to the three Target Area schools:

1. A corner or section of an office or work area was found, where a secretary or some other clerical aide was customarily working. This area was a place where visitors to the school and pupils were unlikely to congregate. A chair was placed in a cul de sac created with file cabinets or low bookcases. This was the "time-out" or isolation area where pupils sat for 3 to 5 minutes immediately following an unacceptable act. It was found that office sounds provided environmental feedback and insured psychological security without providing reinforcers (Secretaries were taught not to attend to the child).
2. Teachers were asked to use partial social isolation (such as restriction to a desk or a work area in the classroom) as a first step. If a given pupil was abusive or destructive after being sent to a desk or restricted work area in the classroom then he was to be quietly taken to the "time-out" area in the clerical room. The usual "time-out" period used was 3 to 5 minutes (Teachers were asked not to "explain" or "negotiate" in order to reduce the amount of attention given immediately following undesirable behavior).
3. In order to disrupt the instructional program as little as possible a classroom aide was often enlisted to quietly escort individuals to and from isolation, permitting the teacher to continue her work with other pupils (Pupils were not asked to escort others since social reinforcement or punishment would undoubtedly occur in such cases).

4. Pupils were taken to the "time-out" area with as little attention as possible. Clerical and administrative personnel were cautioned not to pay attention to the pupil. However, a secretary kept a record of names of pupils, times of arrival and departure, and the manner in which they were treated by the adult bringing them to the area (This record provided information regarding effectiveness of the treatment and occasionally, the need for personnel training in using the "time-out" technique). When requested by a teacher the clerk also set a timer to ring at the completion of 3 to 5 minutes to indicate to the pupil when to return to the classroom on his own.

Teacher Training Methods

The treatment programs for persons displaying predominately Style E and Style F behavior were adapted for use in modifying teacher behavior in EIP classrooms. Upon entry to EIP teachers were expected to know and display a variety of commonly used classroom control and instructional techniques. Some behaviors would be found to be in close agreement with proposed EIP treatment procedures (as outlined in preceding sections of this report) and others would be found in conflict with them. Observed teacher behaviors at entry were, therefore, classified as appropriate (or desirable) and inappropriate. Teacher training personnel were asked to use the procedures outlined in Table 3, that is, attend [illegible], or reinforce, appropriate teacher behavior (as defined by the EIP experimental treatments for Styles E and F) and ignore inappropriate behavior.

When, in rare instances, teachers were found to display unacceptable behavior (such as being repeatedly late to school) their employment in the Project was terminated (i.e., all reinforcers were withdrawn).

Goals for teachers were set in terms of the experimental treatments to be applied in their classroom encounters with pupils. In addition to the social behavior modification techniques described (as operational goals) EIP teaching teams were asked to develop individualized (or personalized) classroom programs consistent with the learning theory described in previous sections of this report. These goals included the following:

1. discovery pedagogy in structured, subject-matter fields (e.g., mathematics and English decoding)
2. direct, expository teaching in motor skill development and in subject-matter fields structured arbitrarily or by custom (e.g., handwriting)
3. programmed learning when materials were found consistent with items 1 and 2 above
4. individualized, ungraded, non-competitive instruction
5. use of CASES treatments as indicated according to individual pupil coping Style
6. avoidance of aversive stimulation (substituting "time-out" for aversive stimulation as punishment when necessary)
7. problem-oriented, self-directed learning consistent with each child's level of skill, knowledge, and social maturity
8. academic (cognitive) goals based on Piaget developmental theory: that is, the provision of concrete experiences as a foundation for concept development, with child's logic respected, and attachment of labels (to concepts) made following mastery and in presence of concrete materials
9. restriction of rote process to non-logical structures of high utility (such as memorization of alphabetical order)

10. high verbal production linked with concrete experience and conceptual development (that is, the extensive use of talking by the pupils in the extending, sharpening, and correcting of pre-concepts during the production, naming, and verbal mastery of firm concepts)
11. extensive use of dramatic play with concrete materials as a source of knowledge, skill, and motivation

Teachers were also given demonstrations in the use of a variety of available instructional materials and methods. Workshops, micro-teaching, and visits to schools where specific materials (appropriate to EIP's experimental treatments) were being used were employed to convey in concrete terms the types of classroom experimental programs intended in EIP. Teachers were asked to select from both the methods and materials they were already familiar with and the new ones introduced to them by EIP research and curriculum specialists to create the most effective classroom programs they could devise, consistent with the operationally defined EIP experimental behavior control treatments (outlined in the preceding sections of this report).

An EIP instructional materials center was established which stocked a wide variety of instructional materials regarded by Project teacher training personnel to be appropriate to the desired experimental treatments. A listing of resources available in the Instructional Materials Center is given in Appendix B.

Each teacher (or teaching team) in EIP developed a program which reflected her own philosophy, experience, and knowledge, as well as the classroom treatment goals set for the Project. Over the five-year period some teachers and teaching teams were more successful than others in achieving classroom practices which were congruent with the intended experimental treatments. In order to investigate and sort out the differential effects of various programs (as actually carried out), the materials used by each teacher (or teaching team) were recorded each year and semester for each EIP pupil.

Modification of EIP Classroom Teacher Behavior

The classroom behavior of every EIP teacher and aide was observed upon entry to the program. Research technicians were assigned to take observational data using the Coping Analysis Schedule for Educational Settings (CASES) and the Spaulding Teacher Activity Rating Schedule (STARS) on a routine basis (see Table 11 for a description of STARS). Treatment programs to bring teacher behavior in line with the desired experimental treatments (of pupils) were initiated and continued until each EIP teacher's behavior approximated the desired pattern. Post checks on all teachers and aides were made periodically to insure the stability of the experimentally induced teacher behavior patterns.

The teacher classroom behavior modification procedure generally took the following form:

1. A 10-day baseline observation was made using CASES and STARS.
2. A conference with the teacher (or teaching team), observer, EIP curriculum director, and director (or research director) was held to discuss results of baseline observations. From this conference one or two children were chosen to become subjects of case studies as specific new teacher responses were suggested and tried out. A specific trial treatment program was worked out from data on the CASES Coping Styles exhibited in specific settings by the case study pupils chosen and based on the treatment programs suggested for those Styles.
3. The trial treatment program was begun and continued for 10 to 25 days (or longer) with daily observations made, results plotted on graphs and shown to the teacher (or team), and suggestions made for modification of the treatments to make them more effective.

Table 11
The Spaulding Teacher Activity Rating Schedule (STARS)*
Mark II
(Brief Form for Quick Reference)

General Transactional Categories (coded in both cognitive and social transactions):

+	Approval - Teacher operants with generally reinforcing effects (affective loadings take priority over cognitive content). Verbal (V) or Non-Verbal (NV)
-	Disapproval - Teacher operants with generally punishing effects (aversive loadings take priority over cognitive content). Verbal (V) or Non-Verbal (NV)
S	Structuring - Teacher operants setting or eliciting performance goals and action, or proscribing certain actions (without aversive affect).
R	Restructuring - Teacher operants repeating, clarifying, or modifying structuring behaviors; when negative affect (e.g., as in nagging) is present score as disapproval (-).
I	Information - Teacher operants conveying information (but not setting or eliciting performance).
L	Listening and Observing - Teacher non-verbal transactional behavior, attending to child or group operants. Listening (L) or Observing (O)

Additional Social Behavior Management Categories (Code under Disapproval when punishment occurs without affect or physical injury):

T	Code T when teacher removes child from social setting (classroom, etc.): "Time-out"
W	Code W when teacher withholds an object or privilege

Additional Cognitive Categories:

Under Structuring (S) and Restructuring (R)

D ↑	Presenting concrete data (D) - asking for operations with concrete data to obtain concepts inductively (↑).
C ↑	Presenting concepts (C) in verbal form - asking for operations with verbal content (concepts) to obtain more complex concepts or to derive a rule inductively (↑).
C ↓	Presenting concepts (C) in verbal form (e.g., names or descriptions) - asking for instances to be given in verbal or concrete form (deductively ↓).
G ↑	Presenting two or more rules or generalizations (G) - asking for a higher order rule or generalization that uses or incorporates the rules or generalizations given (inductively ↑).
G ↓	Presenting a rule or generalization (G) - asking for application of the rule or generalization in specific instances (or the specification of instances in which the rule or generalization holds true).
N	Presenting a concrete object - asking for recall of name (naming = N). Presenting several objects in concrete or figurative form - asking for selection of a particular object by name (name only).

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Table 11(continued)

Additional Cognitive Categories

E	Presenting objects, figures, verbal descriptions of objects or situations - asking for an evaluation (E).

Under Information (I)

D	Presenting, giving, or pointing out concrete objects (D = data) - without asking for or eliciting pupil responses (usually in response to pupil questions).
C	Telling, presenting, or giving names and/or descriptions of objects, singular events, concepts (C), or figures - without asking for or eliciting pupil responses.
G	Telling, presenting, or giving names and/or descriptions of generalizations (G), rules, or hypotheses linking two or more concepts (excluding rules regarding social behavior of pupils) - without asking for or eliciting pupil responses.

Under Listening (L) or Observing (with pupil's awareness) (O)

D	Teacher listening to (or observing) a pupil presenting or pointing out concrete data (D) (objects, figures, pictures of objects, etc.)
D ↑	Teacher listening to (or observing) a pupil operating with concrete objects (data = D), pictures, figures, etc., to derive concepts, inductively (↑).
C	Teacher listening to (or observing) a pupil presenting concepts (C) in verbal form - naming, describing, explaining, etc.
C ↑	Teacher listening to (or observing) a pupil operating with concepts (C) (expressed verbally) to derive a rule or generalization, inductively (↑).
C ↓	Teacher listening to (or observing) a pupil operating with concepts (C) (expressed in words) to derive or select an object, event, or setting to which the concept applies (deductively = ↓).
G	Teacher listening to (or observing) a pupil telling, presenting, or explaining rules, generalizations (G), or hypotheses relating or linking two or more concepts or ideas.
G ↑	Teacher listening to (or observing) a pupil operating with rules or generalizations (expressed verbally) to derive a higher order generalization (G) or more inclusive rule (inductively = ↑).
G ↓	Teacher listening to (or observing) a pupil operating with generalizations (G) or rules (expressed in words) to derive or select an instance in which a rule or generalization applies and/or to use a rule in such an instance to obtain a desired transformation of the data (i.e., solutions to convergent problems) (deductively = ↓).
N	Teacher listening to (or observing) a pupil recall names (N) of objects, concepts, or rules in a rote fashion.
E	Teacher listening to (or observing) a pupil evaluate (E) objects, figures, concepts, generalizations, ideas, etc.
A	Teacher listening to (or observing) a pupil asking (A), requesting, or eliciting assistance, help, guidance, information, permission, in relation to a cognitive task.

4. When the behavior of the case study children became predominately desirable and stabilized, the trial treatment program was discontinued for several days. The teacher (or team) was asked to revert to the procedures used during baseline (called a "reversal" period). After three or four days (or whenever the observed behavior of the case study pupils began to approximate or approach baseline behavior) the trial treatment was reinstated.
5. The post-reversal reinstatement of the trial treatment was continued for 10 days (or until the desirable behavior of the pupils again reached criterion and stabilized).
6. After reinstatement of the treatment for about 10 days, daily observations were discontinued. Post checks on the stability of treatment and pupil behaviors were made from time to time.
7. When additional (or new) social behavior control problems arose the procedure outlined above was reinstated. (Eventually, nearly all EIP teachers had learned to use the experimental CASES based treatments for each of the six types of pupils.)

A number of these special studies have been written up for general distribution and/or journal publication. Abstracts of all those written are presented in Volume III of this report.

Use of Video-Tape, Micro-teaching, and Direct Cueing

In some instances it was found that teachers were unable to utilize effectively verbal descriptions and graphic displays of their classroom behavior. To assist in speeding the process of self-analysis and adoption of experimental classroom treatments video-tapes were made in micro-teaching (or regular classroom) situations. These video-tapes were coded by research technicians in the presence of the teacher (or teaching team). Specific behaviors were identified and labelled (and coded) so that subsequent verbal references to coded observations could be interpreted successfully by the teachers. Frequently, an additional technique was used to assist the classroom teacher in adopting the desired experimental treatments. After a treatment plan had been developed in conference, the teacher was equipped with a wireless, transistorized audio-receiver (with ear speaker) so that she could be prompted during classroom transactions by an observer on the other side of a one-way glass window. This procedure was found to increase greatly both the rate of learning specific experimental treatments and the overall reliability of the complete EIP experimental program.

Designing Management Systems to Permit Treatment Schedules by CASES Style

The several treatment schedules each teacher was expected to learn to use (especially those for Style E and Style F children) required a radical restructuring of the public school classroom to permit and facilitate the setting of treatment variables and environmental parameters. Fundamental to each of the treatments was the concept of the contingent awarding of freedom as a reinforcer following the observation of pupil behavior persistently occurring within clearly defined limits. The amount of freedom given was to be carefully keyed to the ability of the individual pupil to operate successfully and reliably within increments of decreasing structure. The task of creating an instructional setting where such individualized treatments were feasible was a problem of serious dimensions. There are, no doubt, several possible solutions to such a problem. In fact a variety were explored in the several target area classrooms of the Durham EIP. In Target Areas A, B, and C teachers were encouraged to work out their own management systems consistent with the treatment goals outlined above. These individual classroom management systems were worked out by the EIP teachers in terms of their personal needs, the extent of their knowledge of possible systems, their past experience as teachers, and the special limiting conditions in the self-contained classrooms to which they were assigned. To the extent possible they were expected to incorporate elements of the management system demonstrated in the EIP Laboratory School in Target Area D.

The Laboratory School Management System

In the Laboratory School the boys and girls were grouped into four groups or "prides," which met from 8:30 a.m. to 9:00 a.m. for planning and met again from time to time during the day as a group whenever an activity, such as a field trip, dramatic play, music, or a physical education activity, warranted their association as a total group. A pride was made up of equal numbers of boys and girls from each of the several age groups represented in the Laboratory School (ages 5 through 10). It was carefully composed to form a heterogeneous group. The children were chosen on the basis of academic achievement, rate of learning, and degree of socialization.

From 8:30 until 9:00, each pupil planned his daily schedule with the assistance of his pride teacher or a teacher's aide. To complete his plan for the day, a pupil examined several posted schedules and paid attention to specific requirements or constraints. Each day the pride teacher listed on a conference schedule the conferences that each student was expected to attend during the day. Some of these she conducted; others were the responsibility of other teachers or aides in the Laboratory School, but each pupil was expected to examine the conference schedule and put down on his daily plan opposite the appropriate time the location and the subject of the conference. Once he had examined the conference schedule and placed the conferences on his daily plan, he was ready to begin to plan his open laboratory time. Constraints on his freedom were listed on the wall, on a chart rack, or at the bottom of his daily plan sheet. In general, these constraints imposed on him the requirement that he spend at least 40 minutes each on social studies, mathematics, reading, writing (including spelling practice) and an additional 40 minutes in a self-directed activity in either social studies, art, music, or science. Some of the scheduled conferences satisfied requirements in one or another of these academic areas. When he completed his daily plan, all the activities on the required list were expected to be included somewhere in his plan, either as a result of his own planning or the scheduling of conferences by his pride teacher.

Guidelines

Lists of possible ways in which a child could satisfy time requirements in mathematics, reading, writing, or spelling practice were posted. Suggested projects in social studies, art, music, and science were also listed, but a child could derive his own projects from social studies or science units that teachers introduced to him during group conferences in social studies or science.

Work Stations and Traffic Control

In completing a daily plan each child examined the "work station schedule." This schedule listed the times that each classroom or laboratory was open and the number of children permitted to sign up for each of the stations at any given hour. In designing his daily schedule, a pupil picked a work station for each period during the day and inserted his name opposite the work station, provided that the maximum number allowed at the station had not been reached. He continued to pick activities and work stations, placing them on his daily plan sheet until he had filled in all his open time slots. He also included time for going to lunch, physical education, and other routine activities in which he was expected to take part.

When a pupil completed his daily plan, he presented it to his pride teacher or a teacher aide for approval. The signature of either one indicated that the plan had been approved. After the plan was cleared, the pupil began his activities for the day. Throughout the day he was expected to have his daily plan sheet with him. Teachers were expected to examine the daily plans of any student who came to a work station and to place on the plans a symbol, such as a star or a set of initials, to indicate to him and to his "pride" teacher that he had arrived at a particular station on schedule. Similar symbols were placed on the daily plans to indicate display of appropriate study habits, work underway at the proper time, or completed on schedule. Positive comments for quality work, creative ideas or products, or developing skills were also entered on the plan sheets. Figures 4 and 5 present plan sheets for two pupils in the Laboratory School. Following each figure is a copy of the actual plan sheet as used by each child.

Allowances for Differences

Since decision-making and planning are complex processes that must be learned, pupils were given small degrees of freedom at the beginning of the fall semester. During the first two or three weeks teachers or aides planned the students' programs, much as in a conventional, teacher-directed school. After the pupils became familiar with the work stations and with the "daily plan," those who showed the ability to read time and govern themselves in a responsible manner were given a 20-minute period of time for which to choose an appropriate activity and work station. After a student worked effectively for a week or so with one 20-minute slot available for choice-making, additional open time periods were made available gradually - consistent with each person's ability to govern himself and to operate successfully with greater freedom and less structure. In all cases, however, TODAY'S PLAN FOR

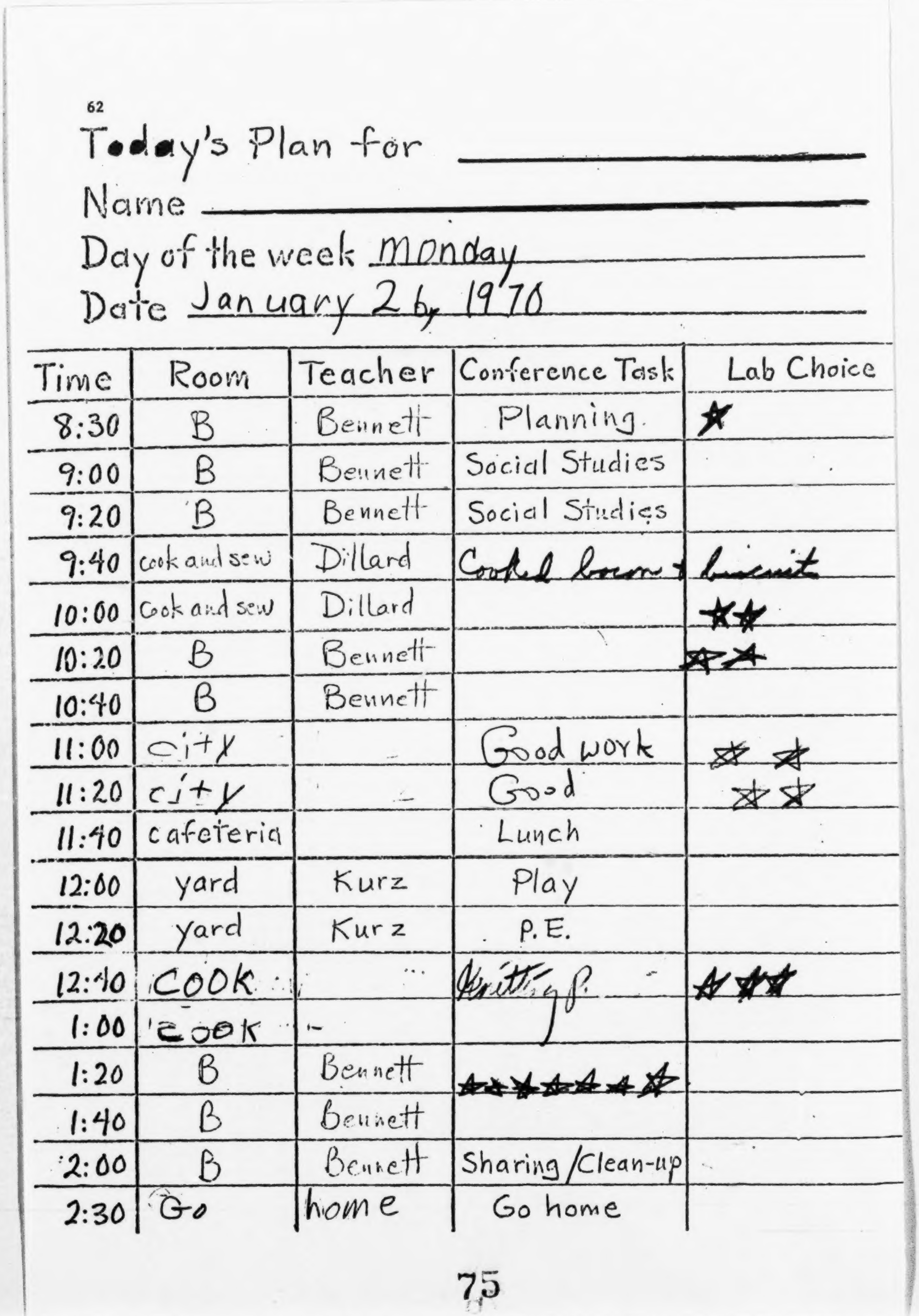
NAME

DAY OF THE WEEK

DATE

TIME	ROOM	TEACHER	CONFERENCE TASK	LAB CHOICE
8:30	B	Bennett	Planning	
9:00	B	Bennett	Social Studies	
9:20	B	Bennett	Social Studies	
9:40	Cooking & Sewing	Dillard		
10:00	Cooking & Sewing	Dillard		
10:20	B	Bennett		
10:40	B	Bennett		
11:00				
11:20				
11:40	Cafeteria		Lunch	
12:00	Yard	Kurz	Play	
12:20	Yard	Kurz	Physical Ed.	
12:40				
1:00				
1:20	B	Bennett		
1:40	B	Bennett		
2:00	B	Bennett	Sharing/Clean-up	
2:30			Go Home	

Fig. 4. A typical plan sheet for a Style E pupil.



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Today's Plan for

Name

Day of the week Monday

Date January 26, 1970

Time	Room	Teacher	Conference Task	Lab Choice
8:30	B	Bennett	Planning	★
9:00	B	Bennett	Social Studies	
9:20	B	Bennett	Social Studies	
9:40	cook and sew	Dillard	Cooked bacon + biscuit	
10:00	Cook and sew	Dillard		★★
10:20	B	Bennett		★★
10:40	B	Bennett		
11:00	city		Good work	★ ★
11:20	city		Good	★★
11:40	cafeteria		Lunch	
12:00	yard	Kurz	Play	
12:20	yard	Kurz	P.E.	
12:40	COOK		Knitting P.	★★★
1:00	COOK			
1:20	B	Bennett	★★★★★★★	
1:40	B	Bennett		
2:00	B	Bennett	Sharing/Clean-up	
2:30	Go	home	Go home	

TODAY'S PLAN FOR ____________________

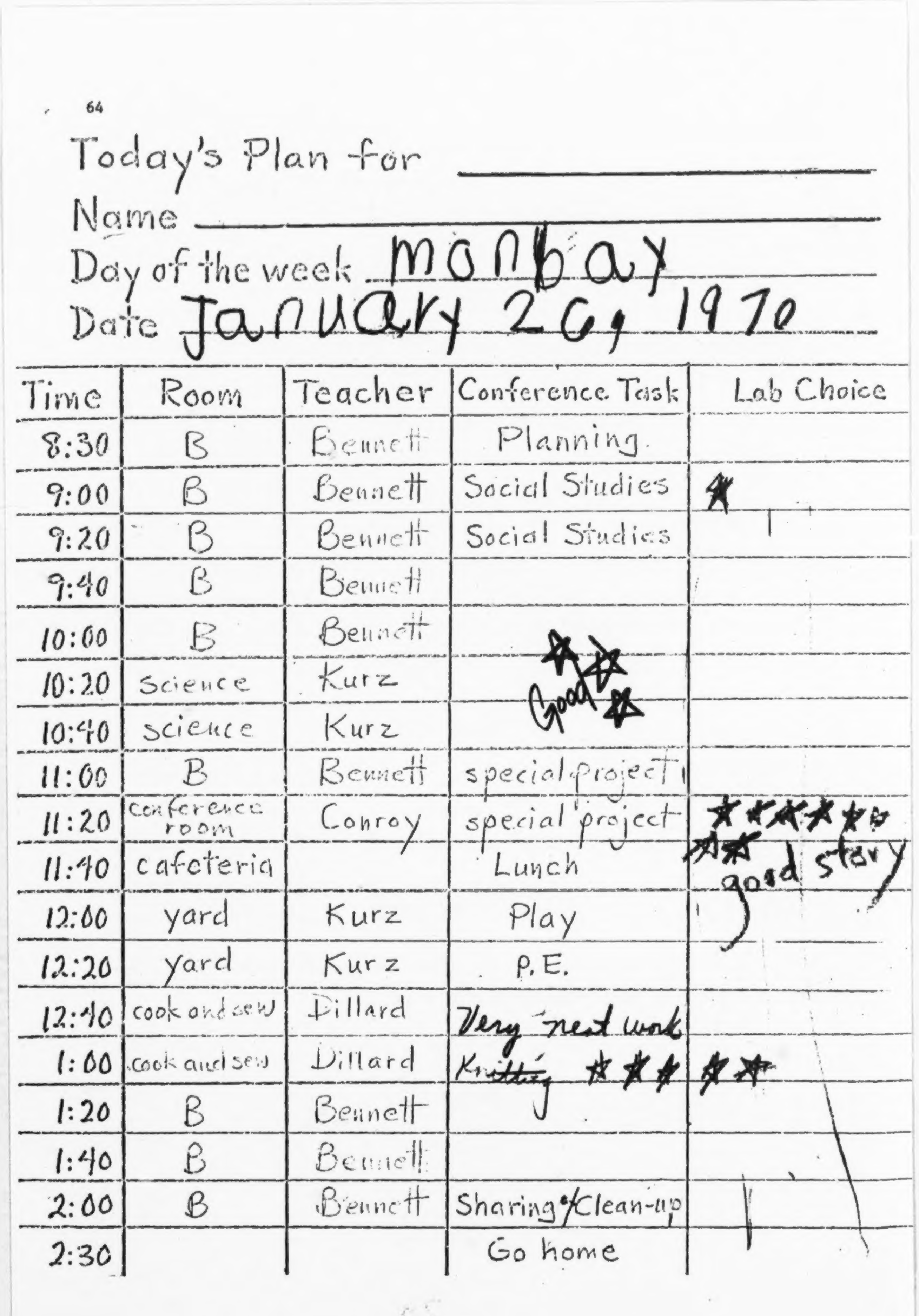
NAME ____________________

DAY OF THE WEEK ____________________

DATE ____________________

TIME	ROOM	TEACHER	CONFERENCE TASK	LAB CHOICE
8:30	B	Bennett	Planning	
9:00	B	Bennett	Social Studies	
9:20	B	Bennett	Social Studies	
9:40	B	Bennett		
10:00	B	Bennett		
10:20	Science	Kurz		
10:40	Science	Kurz		
11:00	B	Bennett	Special Project	
11:20	Conference Room	Conroy	Special Project	
11:40	Cafeteria		Lunch	
12:00	Yard	Kurz	Play	
12:20	Yard	Kurz	Physical Ed.	
12:40	Cooking & Sewing	Dillard		
1:00	Cooking & Sewing	Dillard		
1:20	B	Bennett		
1:40	B	Bennett		
2:00	B	Bennett	Sharing/Clean-up	
2:30			Go Home	

Fig. 5. A typical plan sheet for a Style A pupil.



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Today's Plan for ____________

Name ____________

Day of the week monbay

Date January 26, 1970

Time	Room	Teacher	Conference Task	Lab Choice
8:30	B	Bennett	Planning.	
9:00	B	Bennett	Social Studies	★
9:20	B	Bennett	Social Studies	
9:40	B	Bennett		
10:00	B	Bennett	★★	
10:20	Science	Kurz	Good	
10:40	science	Kurz	★	
11:00	B	Bennett	special project	
11:20	conference room	Conroy	special project	★★★★★★★★
11:40	cafeteria		Lunch	good story
12:00	yard	Kurz	Play	
12:20	yard	Kurz	P.E.	
12:40	cook and sew	Dillard	Very neat work	
1:00	cook and sew	Dillard	Knitting ★★★	★★
1:20	B	Bennett		
1:40	B	Bennett		
2:00	B	Bennett	Sharing & Clean-up	
2:30			Go home	

pupil choices were constrained by the guidelines posted in the pride rooms and listed on the plan sheets. In addition, each pride teacher held routine weekly or bi-weekly conferences with individual pupils to review their daily plans (for the past week or two) and point out their successful efforts and announce changes in their plan sheets as a consequence of their increased reliability and skill. In some cases some freedom (a time slot or two) was taken away for a few days or a week until performance was improved. In most cases freedom was gradually increased. The pride teachers kept records of individual pupil performance in programmed materials and in trial tasks (curriculum specific tests) given in weekly or bi-weekly pupil-teacher conferences. These records were used in reporting progress to parents and in making decisions regarding specific instructional programs needed for individual students or for small groups of pupils. These teacher-kept records were supplemented by results from standardized testing to determine the overall progress of pupils in the several EIP schools. Children were compared with their previous performances and their rates of learning were determined as a guide to evaluation of the effectiveness of a specific instructional sequence. When rates were below expectation for a particular individual or group, changes in program were made to try to effect a more appropriate rate of learning.

Examples of EIP Teacher-Developed
Pre-Kindergarten Programs
(Enrolling children from all Target Areas)

EIP Instructional Programs

Pre-Kindergarten

Wilhelmina Rotella and Nancy Durway, Teachers

Part I. Typical Daily Sequence

Approximate Time & Duration	Title of Activity	Objectives of Activity
Morning Group Schedule		
9:00 - 9:30	1. Free Choice Period	1. To work with others 2. To learn to share 3. To learn to use gross muscles - large blocks and large trucks; large Legos, hammering 4. To learn to use fine muscles in: puzzles, crayons, scissors, pegboards, sewing with needle and thread, small Legos, holding a nail and hammering 5. To learn to care for living things - gerbils, plants, fish, etc.; to learn to nurture growing things 6. To use eye-hand coordination - parquetry blocks, sewing, hammering, puzzles, lotto games, teacher-made games 7. To foster "thinking" and concept development: problem solving activities; similarities-differences; sequences; which-things-go-together; seriation, numbers, classification;

objects, function, size, shapes, composition, colors, textures; labeling, prepositions, discrimination

8. To stimulate conversation with other children and teachers
9. To provide opportunities for teachers to work individually with children

9:30 - 9:40 2. Clean Up

1. To understand spatial relations and learn words for space relations - (the big blocks go *on* the *top* shelf, etc.)
2. To understand temporal relations - (*after* you clean up, *then* you may get ready for group time)
3. To learn responsibility (children wash and clean tables for snack)

9:40 - 9:55 3. Group Time

1. To learn to use oral language to communicate instead of using non-verbal sign language, e.g.:
    a. Each child tells what he played with during free choice period, then fits his name card in the work area slot of the work chart (memory to visual symbol)
    b. The weather of the day is also discussed and the appropriate weather symbol is placed on the weather calendar (observation

EIP Instructional Programs, Wilhelmina Rotella and Nancy Durway, Teachers (continued)

		to representation) 2. To sing songs and act out finger plays
9:55 - 10:00	4. Washing up	1. To learn appropriate techniques of physical hygiene - (washing hands with soap and water)
10:00 - 10:15	5. Snack Time	1. To acquaint children with new foods a. A high protein snack is served at this time. 2. To encourage informal discussions around the tables with emphasis on prepositions, adverbs, colors, shapes, feelings, tastes, etc., e.g. : a. Mary is sitting next to Pamela. b. Angela is wearing her blue dress. c. The milk is very cold. d. The cheese is yellow. What else is yellow?
10:15 - 10:25	6. Book Time (e.g. Listening to stories read and looking at pictures in books.)	1. To learn an appreciation for books 2. To share the teachers' books 3. To make personal selections
10:25 - 10:50	7. Group Time (e.g. to learn through group discussion of ideas, objects, sounds, etc.)	1. To learn a specific concept, i.e. sound recognition 2. To provide opportunities for positive pupil and teacher interaction 3. To learn to take turns 4. To learn to verbalize

EIP Instructional Programs, Wilhelmina Rotella and Nancy Durway, Teachers (continued)

10:50 - 11:00	8. Outdoor Play	1. To use gross muscles and develop coordination in play 2. To develop fine muscles in play 3. To learn to share outdoor equipment 4. To learn to try "new" activities, e.g., learning to climb or learning to pump on a swing
11:00	9. Dismissal	1. To be prepared for the arrival of the EIP station wagon

Teacher Planning Session

11:00 - 12:45	1. Lunch and Planning Time for Teachers	1. To discuss events of the day while eating lunch 2. To plan for the following day and make improvements based on the previous day's lessons 3. To assemble or prepare teaching aides ("home made" games, etc.)

Afternoon Group Schedule

12:45 - 1:00	1. Arrival of Afternoon Children	1. Children arrive between 12:45 and 1:00 depending on the traffic, weather, etc.
1:00 - 3:00	2. Same general sequence of activities as scheduled for the morning group.	1. Objectives are similar for the afternoon group although expectations regarding interest, persistence, level of competence and rate of learning

are lower in view of a six-months younger average age in the afternoon group

3:00 3. Dismissal

Part II. Typical Lesson Plan Structure

Group Time Lesson Plan:

Activity Title: Sound Recognition

Purposes:

1. To learn to discriminate between sounds
2. To learn the purpose of hearing
3. To help the children be more aware of sounds in their environment.

Activities (Procedures):

1. Place various objects which can be manipulated to make different sounds on a table in front of the children (objects include bells, sticks, glass, spoon, scissors, stapler, hammer, tearing paper, etc.).
2. Manipulate each object in the presence of a group of children and ask them to discuss the sound that each makes when manipulated. Give the objects' names if the children do not know their common names.
3. Tell the children that one of the teachers will hide behind the lockers. The children will not be able to see her, but she will take all of the objects with her. She will make a sound with one of the objects. The children will need to listen very carefully so they will be able to associate the sound with the object that made the sound. Ask the children to identify each object they hear, in turn, using the appropriate names.
4. Continue this activity until all objects have been used and identified.

5. When all objects have been explored, ask the children which object made the loudest sound and which made the most quiet sound. Talk about which objects made sounds that were very similar; high or low sounds.
6. Ask, "Are there other sounds that we know?" The children may answer with "fire engine," "ambulance," and names of other common objects which make distinctive sounds. Discuss the kinds of sounds they make and what they mean to us.

Examples of EIP Teacher-Developed Kindergarten Programs

(Enrolling Children from all Target Areas)

EIP Instructional Programs

Kindergarten

Martha Campbell and Aloha Peyton, Teachers

Part I. Typical Daily Sequence

Approximate Time & Duration	Title of Activity	Objectives of Activity
Morning Group Schedule		
9:00 - 9:30	1. Planning	1. To limit activities so there could be more teacher-child interaction
	2. Structured Free Choice e.g. a. Puzzles b. Playing records c. Making sets with beans pasted in circles drawn on construction paper	2. To encourage the use of more educational materials, i.e., picture lotto, matching card games, number sets 3. To improve coordination 4. To encourage completion of tasks 5. To increase language and math skills 6. To encourage working in groups
9:30 - 9:35	3. Clean up and put away materials	1. To put room in order 2. To teach responsibility 3. To help develop sequence of activities
9:35 - 9:50	4. Circle Time (Total Group Time) e.g. a. Helpers' Chart b. Calendar c. Weather Chart d. Sensory experiences: Feel box	1. To teach recognition of names and numbers (items a. and b.) 2. To encourage left to right and top to bottom progression (items a. and b.) 3. To stimulate awareness of environment (item c.)

		4. To develop awareness of the different "feel" of things 5. To develop the ability to describe 6. To develop an awareness of different shapes of objects 7. To help children learn to take turns
9:50 - 10:00	5. Rhythms and Games e.g. Dance-a-story to "Noah's Ark"	1. To allow energy outlet 2. To increase ability to follow directions 3. To increase association of words with actions 4. To allow creative self expression through dramatic interpretation 5. To encourage group participation
10:00 - 10:15	6. Group Time e.g. a. Group A - Peabody Language Development Kit Lesson b. Group B - Activity from Developmental Skills Series Book II "Sensory Experiences" c. Riddles with illustrations for correct response	Group A 1. To help increase oral communication skills 2. To develop auditory discrimination skills 3. To improve usage of standard English 4. To stimulate cognitive development Group B 1. To develop ability to listen for similarities in word sounds

		2. To help the children understand what they hear 3. To help the child associate words with pictures
10:15 - 10:45	7. Free Play e.g. a. Play dough in housekeeping b. Q-tip painting c. Woodworking d. Block play e. Record player	1. To help develop ability to share and take turns 2. To develop coordination of large and small muscles 3. To develop ability to follow through on an activity until completion 4. To allow time for free expression of ideas - verbally and through various media 5. To help the children learn to use a variety of play materials
10:45 - 11:00	8. Clean-up and wash hands	1. To put room in order 2. To help children learn responsibility 3. To prepare for eating snack
	9. Group Singing	1. To provide an enjoyable activity while waiting for final preparations of snack 2. To prepare for eating together as a group activity
11:00 - 11:15	10. Snack	1. To provide nutritional in-between-meal foods 2. To acquaint children with new foods 3. To provide an opportunity for informal, spontaneous verbalization

EIP Instructional Programs,
Martha Campbell and Aloha Peyton, Teachers (continued)

		4. To provide learning experiences e.g. a. How to ask for what one wants b. Color and texture of foods c. Desirable social behavior at meals
11:15 - 11:30	11. Outside Play	1. Same as for indoor play but with an emphasis on large muscle development
11:30	12. Dismissal	1. To meet the bus on time

Afternoon Group Schedule

12:30	1. Arrival of afternoon group	...Objectives for the afternoon group are the same as for the morning except the level of expectation is higher since the children are one-half year to a year older. The directed activities are somewhat more academic.
12:30 - 1:00	2. Planning	
	3. Structured Free Choice	
1:00 - 1:05	4. Clean up and put away materials	
1:05 - 1:25	5. Circle Time	
1:25 - 1:35	6. Rhythms and Games	
1:35 - 1:55	7. Group Time (two groups)	
1:55 - 2:25	8. Free Play	
2:25 - 2:40	9. Clean up and Wash hands	
	10. Group singing	
2:40 - 2:50	11. Snack	
2:50 - 3:00	12. Rest or quiet, small group activities	1. To provide time to relax and rest after eating prior to outdoor play (The morning group rests at home and the afternoon group generally plays all morning)

2. To promote interest in quiet activities such as small-group story reading, puzzles, or resting
3. To learn to listen and to appreciate music and stories

3:00 - 3:15 13. Outside play

3:15 14. Dismissal

Part II. Typical Lesson Plan Structure

Activity Title: Identifying Objects by Touch

Purposes:

1. To develop awareness of the different "feel" of things
2. To develop the ability to describe objects
3. To develop an awareness of different shapes of objects

Activities (Procedures):

1. Provide a box into which a child can place his hand without seeing inside.
2. Select common objects from the room such as pencil, scissors, eraser, crayon, etc.
3. Let children see the objects and name them before putting them into the box.
4. Select one child to reach into the box, grasp an object and feel it, and tell what it is.*
5. After the child responds, ask him to withdraw the object to see if he has named it correctly.
6. Continue until all of the objects are out of the box or until all the children have had a turn. (Discontinue when interest wanes).

*Variations:

1. Ask the child to describe the objects which he feels in the box without

telling its name and ask the group to tell its name. Keep asking for possible names for the object until all common possibilities have been named.

2. Place paired objects in the box and ask the child to find the mates.

Critique

1. Often questions were used to prompt the answer.

   Teacher: It it hard or is it soft?

   Child: It is hard.

2. Children often had to be supplied with descriptive words. This was done by letting the teacher perform as a child, feel the object, and then describe it.

Examples of EIP Teacher-Developed
Ungraded Primary Programs

EIP Instructional Programs

Target Area A - Ungraded Primary

Lossie Mason and Roberta Welch, Teachers

Part I. Typical Daily Sequence

Approximate Time & Duration	Title of Activity	Objectives of Activity
8:30 - 9:00	1. Planning & Opening	1. To help cultivate a feeling of togetherness
		2. To establish plans for day
		3. To give directions on seatwork
		4. To organize activities to be undertaken throughout the day
		5. To discuss the calendar
		6. To discuss special events that have occurred in children's homes
9:00 - 9:45	2. Reading Words in Color (e.g., Charts 5 & 6)	1. To help children learn an approach to discovering phonetic patterns
		2. To provide drill on words previously "worked through"
		3. To use words in sentences to help language fluency development
		4. To help children attack new words
		5. To help children see phonetic relationships between words
9:15 - 9:30	3. Tracing words with individual children (Fernald methods)	1. To provide additional stimuli to help children who are having difficulty learning to recognize words by phonetic and sight methods

		2. To introduce an approach to learning vocabulary that a child can incorporate into his own work habits
		3. To provide encouragement to children who are having difficulty learning to read by a phonetic or sight method
		4. To make the vocabulary meaningful to the child by using words he needs in "writing" his own stories
		5. To provide pleasant drill for vocabulary the child desires to learn
9:30 - 9:45	4. Listening Skills (e.g., SRA Skill Builder #5)	1. To improve each child's ability to listen critically
		2. To improve comprehension skills
		3. To have children learn to correct and record their own work
		4. To increase interest in literature
		5. To provide stimulation for oral discussion
		6. To develop attentive listening habits
		7. To provide material that is useful for discussing emotional reactions
		8. To provide practice in recognizing the main ideas in stories
		9. To recognize the sequence of a story
		10. To listen for fun

EIP Instructional Programs,
Lossie Mason and Roberta Welch, Teachers (continued)

9:45 - 10:05	5. Music (Mr. Webber)	1. To promote interest in music 2. To develop skills in singing and dancing 3. To develop music reading skills 4. To develop rhythm skills
10:05 - 10:10	6. Break	1. To permit children to go to lavatory 2. To prepare for next activity
10:10 - 11:30	7. Reading (e.g., SRA Reading Lab)	1. To meet reading needs of each child at his own level 2. To develop comprehension skills 3. To help children understand the meaning of words encountered in reading 4. To develop specific reading skills, such as making plurals, forming possessives, recognizing contractions and compounds, and understanding alphabetical order 5. To develop word analysis skills at each child's level 6. To provide interesting stories for the child's enjoyment
10:30 - 11:00	8. Sullivan Programmed Readers (e.g., Books 9, 12, 16, 19)	1. To encourage independent reading 2. To provide reading materials that can be corrected by each child as he works 3. To develop linguistic skills for word attack

EIP Instructional Programs,
Lossie Mason and Roberta Welch, Teachers (continued)

		4. To increase each child's comprehension skills 5. To provide stories that provide material for discussion of main ideas, emotional reactions, sequence, characterization etc. 6. To increase a love of reading for enjoyment 7. To develop spelling patterns 8. To develop oral reading skills
11:00 - 11:30	9. Individualized Library Reading	1. To increase enjoyment of reading 2. To provide reading material that interests each child 3. To increase comprehension skills 4. To increase abilities in oral and silent reading 5. To develop related creative skills such as puppet shows of stories read; paintings of favorite characters; mobiles of favorite animals in stories; poems related to ideas in stories read 6. To provide opportunities for children to share from their reading with each other
11:30 - 12:00	10. Lunch	1. To develop good eating habits 2. To encourage good manners

		3. To enjoy eating with others
12:00 - 12:15	11. Listening and Relaxation (e.g., Story read to class)	1. To develop an interest in literature
		2. To encourage oral discussion of story
		3. To enjoy relaxing together
12:15 - 1:00	12. Mathematics (e.g., Math Workshop)	1. To extend pupils' understanding of multiplication and division
		2. To provide pupils with further opportunities to perfect their skills and techniques with addition and subtraction
		3. To provide practice with various number bases
		4. To learn symbols of multiplication and division
		5. To show the importance of understanding multiplication and division
		6. To relate multiplication to money, telling time, linear measurement, and geometry
		7. To develop an understanding of the various representatives of multiplication and division e.g.; a) 3 X 2 c) $\begin{array}{r}3\\ \text{X}\ \underline{2}\end{array}$ b) 6 ÷ 3 d) $3\overline{)6}$
1:00 - 1:30	13. Social Studies (e.g. Seasons of Year)	1. To develop an understanding of seasonal change

EIP Instructional Programs,
Lossie Mason and Roberta Welch, Teachers (continued)

			2. To encourage oral discussion
			3. To develop an understanding of animal reaction to weather change
			4. To develop an understanding of plant reaction to the changes of the seasons
			5. To use creative writing skills
			6. To develop sequencing in writing own stories
			7. To use word boxes to develop alphabetical order and to find own correct spelling of words needed
1:30 - 2:00	14.	Physical Education	1. To develop sportsmanlike attitudes
			2. To learn to follow game rules
			3. To develop physical abilities of catching
			4. To enjoy playing together
			5. To increase pupils' physical fitness in general
2:00 - 2:10	15.	Food (snack) & Relaxation (e.g., milk and crackers)	1. To provide relaxation from physical activities
			2. To relax together
			3. To provide additional nourishment
2:10 - 2:30	16.	Evaluation and Dismissal	1. To give children a chance to evaluate their own work with the teacher
			2. To organize audio-visual materials in the room for the next day's use

Part II. Typical Lesson Plan Structure

Activity Title: Tracing new words and writing a story with an individual child.

Equipment: Sandpaper, word box, a piece of chalk, pencil and paper.

1. Have child who has had difficulty learning to read by other methods come up individually to tell and write his own story.
2. Review material from previous day's discussion (e.g., "spring").
3. Encourage child to begin own story.
4. If child is having difficulty getting started, encourage child to draw a picture of "spring" and discuss this with him as he colors his picture.
5. When child is ready to write encourage him to search for needed words in his word box.
6. Review the alphabetical order of the word box and how he can find words by this system.
7. When the word is not known by the child and is not in the word box, write the word on a card for the child to see.
8. Then have the child write this word with chalk on a piece of sandpaper. He should verbalize the word as he writes it.
9. Then the child traces the word with his finger (the feel of the sandpaper will help him remember the feel of the word).
10. Next he turns the word card and sandpaper upside-down and tries to write the word on another piece of paper.
11. If he is correct when he checks the word, he is now ready to place it in his word box. If he is not correct, he repeats the tracing and writing process again.
12. When he has written it successfully, he writes the needed word in his story.
13. While the child is writing he often needs encouragement to continue.

14. Upon completion of story and picture the child adds this story to his set of stories.
15. If the child desires he may then type this story and/or read it orally to the other children.
16. Later the story may be copied and each child may receive a duplicated copy of the child's story.

Part III.

Comments on this activity:

1. The tracing method really seemed to increase this child's vocabulary. Words were remembered for longer periods of time. Recognition and spelling improved.
2. A loose-leaf notebook of this child's typed stories would be motivational.
3. Plans for further sentences should be made using the words used today in order to reinforce the impact of these words.

EIP Instructional Programs

Target Area B - Ungraded Primary

Phyllis May, Teacher

Part I. Typical Daily Sequence

Approximate Time & Duration	Title of Activity	Objectives of Activity
8:30 - 8:50	1. Sharing Time (anything of interest) a. experiences b. books c. stories d. new clothing e. toys f. experience charts	1. To learn to express (orally) ideas and experiences 2. To learn to tell events in sequence 3. To learn to contribute to discussions 4. To learn to listen while others are speaking
8:50 - 11:00	2. Language Arts a. Reading Fernald Language experience approach Words in Color Sullivan SRA Self-selection reading	1. To learn to understand what is read 2. To learn the beginning and ending sounds of words 3. To learn the sounds of vowels and consonants and consonant blends. 4. To learn word attack skills 5. To learn to read well orally 6. To learn to read, write and spell a basic vocabulary 7. To acquire the knowledge of sound - symbol relationships and to generalize to other phonetically regular words 8. To learn to read and write own books and stories 9. To learn to develop an interest in words

Reading (continued)

10. To increase the child's vocabulary
11. To learn to follow directions
12. To learn to enjoy reading and reading experiences
13. To learn to think and work independently
14. Encoding
15. Decoding
16. To establish the habit of left to right visual progression
17. To help visual reversal problems by tracing

b. Language

1. To learn to express ideas orally
2. To learn to express ideas in writing
3. To contribute effectively to class discussions
4. To develop a fairly good range of meaningful concepts
5. To tell, retell, or write a story in proper sequence
6. To learn to speak clearly and plainly
7. To learn the correct usage and meaning of words

c. Spelling

Writing stories and books
Spelling workbooks
Word boxes

1. To learn beginning, medial and ending sounds
2. To spell words needed in writing
3. To learn to spell phonetically

EIP Instructional Programs, Phyllis May, Teacher (continued)

	Spelling (continued)	4. To learn to spell certain sight words
		5. To learn to recognize and write the letters of the alphabet
		6. To learn prefixes and suffixes
	d. Handwriting	1. To learn to form letters correctly
		2. To learn to write neatly
11:00 - 11:45	3. Mathematics a. Wirtz Botel b. Rasmussen c. Cuisenaire Rods	1. To develop an understanding of numbers (what a numeral stands for)
		2. To learn to form numerals correctly
		3. To use number facts in solving problems
		4. To learn four fundamental processes: Addition Subtraction Multiplication Division
		5. To develop an understanding of equalities and inequalities
		6. To learn how to use a number line
		7. To develop geometric recognition
		8. To develop an understanding of measurement
		9. Counting
		10. One - to - one correspondence
		11. To establish a discovery learning approach
		12. To learn basic number facts
11:45 - 12:10	4. Music	1. To enjoy and appreciate music

EIP Instructional Programs, Phyllis May, Teacher (continued)

	Music (continued)	2. To learn and sing new songs 3. To participate in rhythm activities 4. To learn to play rhythm instruments 5. To develop singing skills 6. To learn to compose music
12:10 - 12:45	5. Lunch	1. To learn to interact socially 2. To learn proper etiquette and table manners
12:45 - 1:00	6. Story time	1. To learn to appreciate and enjoy literature 2. To gain ideas and information for writing their own stories
1:00 - 1:30	7. Words in Color	1. Decoding and encoding phenomes
	8. Individualized reading	1. Enjoyment of reading
	9. Creative writing	1. To learn how to put thought into written form
	10. Oral reading	1. To learn to read from a text with clarity
1:30 - 2:15	11. Art and/or Physical Education	Art 1. To encourage creativity in art 2. To explore a variety of media Physical Education 1. To develop physical and social skills 2. To develop basic muscular strength and the coordination needed in fundamental physical skills

EIP Instructional Programs, Phyllis May, Teacher (continued)

		Physical Education (continued)	3. To develop courage, initiative, alertness, self-control and cooperation
2:15 - 2:30	12.	Clean up	1. To develop a sense of pride in the classroom and respect for the belongings of individual members 2. To assume responsibility for care of the classroom 3. To follow directions in a group task

Part II. Typical Lesson Plan Structure

Language Arts Activity Lesson Plan:

Activity Title: Writing and Reading Using the Fernald Method

1. Give a small group of the children a model sentence of subject to write about.
2. Write words each child needs on a flash card.
3. Have him say each word aloud while tracing it.
4. Ask him to write the word on a piece of paper without looking at the word traced.
5. Compare the word written with the word traced to see if it has been spelled correctly.
6. If the word is spelled correctly, encourage the child to write the word in his story. If it is not spelled correctly, ask the child to trace the word and say it aloud until he is able to write it without looking at the word.
7. Ask the pupils to file all words used, alphabetically, in individual word boxes to be available for use in future stories the children will write.

Critique

1. When this method (the Fernald method) was started we found it best to teach small groups of children because much individual attention was needed.
2. The children were slow in learning to trace the letters with precision.

EIP Instructional Programs

Target Area C - Ungraded Primary

Cora Peaks, Teacher

Part I. Typical Daily Sequence

Approximate Time & Duration	Title of Activity	Objectives of Activity
8:30 - 9:00	1. Planning	1. To prepare for the day
		2. To give pupils an opportunity to be self-directive in their learning
		3. To assist if needed with individual planning
		4. To give directions for work sheets, etc.
		5. To answer individual questions
8:30 - 8:50	2. Reading Words in Color	1. To give pupils opportunity to share poems and other written work
		2. To continue with visual and oral dictation games to help pupils master the correct production of the words studied on the charts.
		3. To continue with transformation games where pupils are requested to select pairs of words and try to link them by words obtained from them by four operations (e.g., ship to child).
		4. To encourage pupils to make their own transformation games
		5. To review operations used in transforming words

EIP Instructional Programs, Cora Peaks, Teacher (continued)

	Reading (continued)	6. To read another episode in a serial story
		7. To interpret the statements of story characters to determine their emotional attitudes
		8. To evaluate events read, in terms of cause and effect
		9. To read to find the answer to a summarizing thought question
8:50 - 9:00	3. Creative Writing	1. To give pupils an opportunity to use their own creativity to write sentences turning to the charts (Words in Color) as a reference
		2. To give pupils an opportunity to use their own creativity to make books, compose songs, write poetry and plays
		3. To have pupils become poets, authors, illustrators and lyricists
9:00 - 9:10	4. Listening SRA Listening Skill Builder - 10 or Jumbo	1. To improve the pupil's listening ability through listening materials
		2. To have pupils check, score and evaluate their own record pages
		3. To learn to listen more effectively
		4. To improve listening comprehension
		5. To listen for enjoyment and pleasure
		6. To develop the habit of attentive listening

EIP Instructional Programs, Cora Peaks, Teacher (continued)

	5. Programmed Reading Book 20 in the Sullivan Series for example	1. To continue individualized independent reading 2. To have pupils continue with their study of Greek mythology 3. To discuss the reign of Cronus, the war of the Titans, the three great gods and the creation of man
9:20 - 9:30	6. SRA Reading Lab	1. To build reading-thinking skills - a. main ideas b. likeness-differences c. cause-effect d. sequence and organization e. drawing inferences or conclusions f. remembering 2. To stress word meaning and word analysis 3. To have pupils become self-corrective
9:30 - 9:45	7. Library (Mrs. Smith)	1. To review the two main parts of the book collection - fiction and non-fiction 2. To review parts of a book a. title page - author, title, illustrator, publisher b. table of contents c. index d. copyright 3. To review the basic reference books

EIP Instructional Programs, Cora Peaks, Teacher (continued)

	Library (continued)	a. encyclopedias b. dictionaries 4. To introduce the card catalog a. purpose b. arrangement of the drawers c. location of books by author and title
9:45 - 10:00	8. French (Mr. Baylin)	1. To use colored rods to introduce several colors, numbers and brief commands to establish a simple and limited vocabulary 2. To manipulate these few basic words, colors and numbers in numerous ways to establish the conversational tone of the lesson 3. To become comfortable in communicating in a foreign language
10:00 - 10:15	9. Free Play	1. To give the opportunity for free play 2. To encourage pupils to become creative in their play
10:15 - 10:30	10. Language	1. To review the four kinds of subjects a. personal pronoun b. a proper noun c. a determiner and common noun d. a common noun by itself 2. To teach the indefinite pronouns as another kind of subject

EIP Instructional Programs, Cora Peaks, Teacher (continued)

	Language (continued)	3. To teach the verb and predicates
10:30 - 10:40	11. Spelling	1. To spell the ŭ sound: a. with o b. with eu c. with oe d. with oo e. with ue f. in the vowel consonant-e pattern 2. To encourage pupils to use their spelling dictionary to find the meaning of words that are unfamiliar to them 3. To encourage pupils to build their own crossword puzzles using words that are consistently difficult for them
10:45 - 10:50	12. Library	1. To encourage pupils to use the library for pleasure reading 2. To encourage pupils to read the newspapers and magazines
10:50 - 11:00	13. Science Project	1. To find out that water and minerals come into a tree through its roots through an activity 2. To find out that water and minerals flow in tiny tubes from the roots to the leaves 3. To learn that along with tubes the tree also develops fibers

EIP Instructional Programs, Cora Peaks, Teacher (continued)

		Science Project (continued)	4.	To learn that wood from some trees is hard and that from others it is soft
11:00 - 11:30	14.	Lunch	1.	To stress good table manners
			2.	To encourage the tasting of unfamiliar foods
			3.	To stress soft talking
11:30 - 11:45	15.	Sewing	1.	To sew as a reward for another activity
			2.	To learn to make simple articles by sewing
			3.	To sew for pleasure
11:45 - 12:00	16.	Conference	1.	To discuss successes and mistakes
			2.	To listen to new ideas
			3.	To discuss individual progress
			4.	To discuss problems encountered
			5.	To show the need for self evaluation
			6.	To give an opportunity for conversation
12:00 - 1:00	17.	Math (for example, interpretation and construction of graphs and tables)	1.	To illustrate the need for organizing a body of data into a usable form for reference
			2.	To learn the names for parts of a table
			3.	To stress the importance of titles
			4.	To provide practice in titling and labeling
			5.	To learn to read a picture graph and recognize it as a "pictograph."

	Math (continued)	6. To have pupils make picture graphs of their birthdays
1:00 - 1:30	18. Physical Education (e.g., Hot Ball)	1. To improve catching 2. To develop the ability to catch and pass quickly 3. To learn to play fairly
1:30 - 2:30	19. Social Studies (e.g., Maps)	1. To review the concept "globe" 2. To review the concept "map" 3. To review map symbols 4. To encourage pupils to make a map of the school community
2:30 - 3:00	20. Art (e.g., Collage)	1. To introduce collage as an art form in which materials of different colors, textures and shapes are assembled into a design 2. To encourage pupils to handle, shape and study a variety of materials and arrange and rearrange them into designs 3. To encourage pupils to try different arrangements of their collage materials before pasting them
3:00	21. Dismissal	

Part II. Typical Lesson Plan Structure

Activity Title: Creative Writing (Pupil shares her poem with classmates)

Mr. Roundabout and Mrs. Roundabout

Mr. and Mrs. Roundabout
Went downtown.
They saw a parade
With the funniest clown.

They went back home
To make a filabree cake,
But Mrs. Roundabout
Didn't let it over burn.

With them lives Wilbur,
The little mouse.
He runs around
In the house.

Polly, the parrot
Was very rosy.
She went around
Very nosy.

There was
The cat.
Who chased and chased
Every rat.

Mr. Roundabout
Played his fiddle
With a sound like
Diddle, diddle, diddle.

Mrs. Roundabout
Did not rest.
Because she had to iron
Her husband's vest.

Mr. Roundabout with a
Jolly little face
Went to the table
And sat in his place.

Mr. and Mrs. Roundabout
Were so jolly and fat
Then together
They sat.

Mrs. Roundabout
Took a rest
And sewed
Another vest.

They went
To the zoo.
Where so many animals
Look at you.

When they got home
From the zoo,
She scared Mr. Roundabout
With a BOO!

Mr. Roundabout told
Stories of Greek myths.
One was about three Cyclops,
The great smiths.

Jupiter had a wife
Named Juno.
Venus' child shot
An arrow at Pluto.

Neptune was god
Of the sea.
I didn't know
How this could be.

Apollo was
God of sun.
He had wild horses
That could run.

Venus was goddess
Of beauty and love.
She always knew
Jupiter was above.

Mr. Roundabout said
That's the end
And started putting
Up his pen.

---------Sherry Brown

Activity Title: Playing "teacher" with Words In Color.

1. Have pupils continue with game of "Teacher." (Pupils can make one or two sentences, but this will depend on the pupil.)
2. Review the rule of the game - The teacher can have her pupils give the oral dictation as the words are pointed out or have pupils watch silently the visual dictation of sentences and give the oral dictation accurately.
3. Remind pupils of another rule - If someone cannot find a word tell them the chart number.
4. Ask pupils for their transformation games. (If none, continue with one planned.)
5. If pupils have no transformations to suggest use "ship --> child."
6. Ask pupils to review the four operations used in the game. (Reversal, addition, insertion, substitution)

Questions:

a. What symbol will we use for reversal? Give a definition. (e.g., "r" - "reversal is to change signs to the opposite.")
b. What symbol will we use for addition? Give a definition. (e.g., "a" - "addition means to add a sign at either end.")
c. What symbol will we use for insertion? Give a definition. (e.g., "i" - "to insert a sign in between other signs.")
d. What symbol will we use for substitution? Give the definition. (e.g., "s" - "to substitute one sign for another.")

7. Put game on the board - e.g., "ship ---> child"
8. Ask for the first solution.
9. Continue until the time for the game is completed or all ideas are exhausted.

Activity Title: Independent Reading

1. Have pupils read story #18 silently.

Questions:

a. What was brought in from the truck?

b. What did Mom answer the children who wanted to open the box?

c. What did the children think was inside?

d. How did they make sure that their guesses were right or wrong?

e. What did Dad do on arrival?

f. What did the children bring out of the box?

g. How did they get it out?

h. If you were the children how would you have felt about the box?

Critique:

Sharing Sherry's poem really inspired the others to share more of the creative writing.

The transformation game was not completed. Simpler games are needed for practice.

No difficulty was encountered with the story.

EIP Instructional Programs

Target Area D - Ungraded Primary - Laboratory School

Alma Bennett and Louisa Douglass, Teachers

Part I. Typical Daily Sequence for a Child (planned partly by the child)

Approximate Time & Duration	Title of Activity	Objectives from Teachers' Point of View
8:30- 9:00	1. Planning	
9:00- 9:40	2. Social Studies (e.g., Mailing and delivering letters)	1. To learn that mailmen deliver the mail to each house or wherever it is being sent 2. To learn that letters are sorted by size. 3. To learn that air mail, registered mail, and certified letters have special handling 4. To learn that it costs money to send a letter 5. To learn that mail trucks pick up mail from trains, planes, and other post offices and carry it to the main post office
9:40-10:20	3. Language Arts Reading Spelling Oral and Written Expression (e.g., Letter Writing)	1. To learn to write a friendly letter 2. To learn to use capital letters and punctuation marks correctly 3. To learn to read and write simple sentences 4. To learn to spell the words needed to write a letter 5. To learn to be original

EIP Instructional Programs, Alma Bennett and Louisa Douglass, Teachers
(continued)

10:00	4. Snack (Served in classroom)	1. To learn to talk quietly while eating 2. To learn to share and take turns 3. To learn to dispose of waste materials properly
10:20-11:00	5. Media Center (e.g., doing research)	1. To learn to use resources to find information about mailing and delivering letters 2. To learn to work with other children on a common task
11:00-11:40	6. Graphics	1. To learn to use proportion and arrangement in illustrative expression 2. To learn to use colors effectively 3. To learn to share responsibilities
12:00-12:40	7. Physical Education (e.g., a game - "Flying Dutchman")	1. To learn to engage in physical activity for enjoyment 2. To learn rapid mental and physical coordination 3. To learn social skills in cooperative physical play
12:40- 1:20	8. Sewing (e.g., sewing mailbags)	1. To learn to measure by the yard and one half yard 2. To learn to make a mailbag
1:20- 1:40	9. Science (e.g., making a weather chart)	1. To learn that mailmen deliver mail in all kinds of weather 2. To learn about the following weather instruments: thermometer, anemometer, wind vane, barometer

EIP Instructional Programs, Alma Bennett and Louisa Douglass, Teachers (continued)

	9. Science (continued)	3. To learn that the sun plus air plus water equal weather
1:40- 2:00	10. Mathematics	1. To learn the arithmetical terms: how many; more than; less than; all together; cost of 2. To learn to recognize and read the cost of stamps 3. To learn that most stamps are rectangular in shape and that some are triangular 4. To learn to solve simple word problems involving the purchase of stamps
2:00- 2:30	11. Sharing and Clean-up (e.g., showing mail bags to classmates and children in other classroom)	1. To learn to appreciate work done by others 2. To learn to be courteous toward others 3. To learn the value of order, the appropriate storage of materials, and the disposal of waste

Part II. Typical Plan for a Conference with Mrs. Bennett

Language Arts Activity Lesson Plan:

Activity Title: Writing a Letter (9:40-10:20)

Purposes:

1. To learn to write a friendly letter
2. To learn the parts of a letter
3. To learn to be original
4. To learn how to compare written work with the model

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Part II. Typical Lesson Plan Structure (continued)

Purposes (continued)

5. To learn to address an envelope
6. To learn to use capital letters and punctuation marks appropriately

Activities (Procedures):

1. Have a model letter written on chart paper illustrating the parts of a letter.
2. In the heading of the letter ask the children to find these names: the school, the street, the city, the state, the month.
3. Ask the children to tell how these names begin. Ask how the first word in the greeting begins. "Does the title, Mr., begin with a capital?"
4. Tell them the main part of the letter is called the message. Ask them to look at the first line and see where it begins. Say, "It is indented. That is, it goes in a little."
5. Ask if they see that a lot of room was left on the paper around the letter. Tell them this space is called the margin. "Yours truly" is the closing and the name tells who wrote the letter.
6. Tell the children that periods, commas, and question marks are called punctuation marks. Ask, "Where do you find commas in the heading? What mark is after Mr.? Are there commas after the greeting and the closing?"
7. Ask the children to think of someone they would like to write a letter to. "Some of you may want to write your classmates to thank them for giving you valentines. Some may want to write thank-you letters for the valentine party."

Part II. Typical Lesson Plan Structure (continued)

Procedures (continued)

8. Make a list of the people the children want to write to. Write on the chalkboard, also, the words they need help with. Encourage them to make their letters interesting and original. Remind them to check their letters by the model on the poster. Encourage them to check carefully for capitalization and punctuation.
9. Walk around, giving help where it is needed. As the children finish put their letters on the bulletin board. Compliment each child for his work.

Critique:

The letter writing activity proved to be an enjoyable activity for most of the children. Learning the five parts of a letter was new and apparently challenging. They liked having a model to go by. Most of them followed the capitalization and punctuation but they didn't understand the margin and indention. Much more practice will have to be given in these areas.

Introducing the margin and indention along with the five parts of a letter might have been too much for one lesson. Attention will be called to margins and indention in all reading and paragraph writing to see if that helps. A follow-up lesson on the five parts of a letter will be given each week to check on understanding of the format.

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Part III. Typical Daily Sequence of a Teacher

Approximate Time & Duration	Title of Activity	Typical Content of Activities
8:30 - 9:00	1. Planning	Make free choices. Explain work needed in laboratory situations to individuals. Children not involved are working on writing (using Handwriting with Write and See by B. F. Skinner and Sue-Ann Krakower, Lyons and Carnakan Inc., Chicago, which is almost totally programmed). Others in Sullivan Programmed Readers or writing stories. We have used practically no work sheets at this period since very early in school year. Explain any changes in plans for the day and give other directions as needed.
9:00 - 9:40	2. Social Studies (typically utilizing dramatic play in a child size "city." See note at end of Part III, page __, for an explanation of Social Studies and "dramatic play" in Southside School.)	In dramatic play the "policemen" have had trouble finding constructive things to do. We recently revisited the Durham police station for further study. Today we have a chart which includes many things poliemen do: walking a beat, checking on various stores, going to the bank, cashing their salary checks, going to fires and accidents, helping any citizen in trouble, investigating crimes, writing reports, going to the court. Children read chart together; the problems in

EIP Instructional Programs, Alma Bennett and Louisa Douglass, Teachers
(continued)

the "city" are discussed. Our object is to expand information, build desirable social attitudes, and help the creative play be more authentic. Children are chosen to be policemen, others to be store-keepers, bankers, etc; each person is given a chance to participate. We enact several episodes with policemen doing different jobs. The children learn to be a good audience; they know they will have a turn. At the end we evaluate. The test of the lesson will come in how well they play in the "city." We will observe this in dramatic play tomorrow.

9:40 3. Language Arts

This is a very independent group. There are first, second, and third year students here, but all read fairly easily. We are working on finding the main thought in paragraphs. The children select from various books and read short stories independently. When through they choose a paragraph, read it aloud, and tell in their own words the main thought of the paragraph. The question we ask is, "How much could we leave out and still know what the paragraph is telling us?" Cutting back is the hardest thing for

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(continued)

them to do. We need more practice in extracting the essence of a paragraph. While this group is working with me, two children have chosen to remain in the room to tape record a story they are reading and one child is working on phonics cards with the language master.

10:20 4. Language Arts

What a contrast! We need every gimmick known to man to keep this group working. They love picture post cards, so today we start with some carefully selected post cards to work in with some initial sounds from Words In Color. They name the things in the cards. My aim here is to help build vocabulary. Since I have chosen the cards and am choosing words with sounds with which I know I am going to be working (democracy is usually like that): plane, pond, motel, mill, bridge, dam, deer. As I choose the words they say, I print them on cards. The cards are shuffled, child draws a card and points to picture on post card. I continue until all have two turns. Now: "Find color of sound on the charts" (phonics charts). On wall charts I ask them to find other words.

Each game can take only a few minutes, ten at most, or interest is lost. Two children now start on Sullivan work book, one works with Language Master phonics cards made especially for each child (the answers are on the back and he checks his own work). There are two very independent readers now in the room who have chosen to work in room on Sullivan workbooks (only completely independent people may choose the Pride room during this period). One will be teacher for questions re Sullivan while I take dictation on a story from the other child. I am amazed at the "teacher." She has really learned to require her charges to sound out words. She gives a lot of praise and goes on with her own work. We switch jobs twice. Tomorrow we will get stories to read from other children. The two who have dictated stories to me now read them back to others with me. I will have them typed for the authors to illustrate with pictures tomorrow.

11:00 5. Language Arts

The abilities in this group are more varied than either of the other two and I rely heavily on Sullivan. The range is from Book 5 to Book 13. The child who deciphers the words least readily is also (in this class) the one who understands the meaning of the story most readily. To keep his interest in reading, the two who decipher most easily and insist on staying in the same place in books are reading aloud to him. He tells them what the words they are reading mean. Everyone profits for about ten minutes. I am working with others on changing vowel sounds when final e is silent. I make the usual list on board, "can", "cane", etc. We start with WIC charts pointing out similar shapes and different colors. (These children do not work regularly on WIC with me; the ones who need it have it in the tutoring rooom with Mrs. Conroy). My goal here is to teach this one basic clue and to try to get the kids to look at the whole word rather than just the initial letter and vowel. Then we read charts, short sound first, add an "e," ask for long sound. I remind them that nothing works everytime, these are just clues. This is a short lesson and we have time to write stories to go with the pictures we did about the work policemen do. They get their word boxes and everyone starts to work. David dictates his story to me but others

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(continued)

write their own. I insist that they all trace the words they need from word cards with a finger. I help them all spell and the three who really need it for reversal problems don't feel imposed upon.

11:45 6. Lunch Period

Lunch, and a free period for me. Goals during lunch are to help children understand that generalized conversation does not have to be carried on at the top of one's lungs, letting each person have a chance to express his view, and some improvement in table manners.

12:40 7. Mathematics

Children have been adding equal numbers. We have talked of adding three fours, putting four on the paper three times. Today we will use the multiplication symbol after some work with concrete objects. The children have twelve chips and some long strips of paper. We arrange one row with four chips; and each arrangement is followed by questions: How many chips? How many rows? Another row is arranged right beneath the first: How many chips? How many rows? How do we write this? I demonstrate: 2 X 4 = 8. I ask for another row. Who can figure how this would be written? I ask them to place strips between rows. "Now divide into twos." "Put the strips up and down." "How many twos?" etc. Aims: Commutative property of multiplication. The relation of multiplication to addition. The conventional method of writing what is done.

During the last part of period children return to workbooks. Some are using the multiplication symbol now.

1:20 8. Mathematics

Children are learning to regroup for subtraction. Aim: To recognize that the slips of paper may be regrouped at will, but the base is ten and a group in the decimal system must have something to do with ten. Using slips of paper and rubber bands children make two place numbers on chart. I ask them to subtract a number that has fewer in both tens and ones places from a larger number. When several have done this, and written the procedure on the board, I ask them to subtract a number with more in the ones place in the denominator than in the numerator (not using these terms however at this time). For example, I ask them to subtract 17 from 41. The children discuss what to do. They unbundle a ten. I ask "How many tens are left?" We discuss how to write the process. This will require many different words and approaches to insure understanding. The children do very

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(continued)

			well with the charts and concrete materials but are not translating it accurately to written work.
2:00	9.	Clean-up and Sharing	Clean-up, share, plan tomorrow's work, read a story. The pride collects itself very slowly. Everyone has some unfinished business. The problem is to get an audience for the people who want to share. I have decided each one must come in first and sit down before finishing up. Then each person who has something to share does so. At 2:15 people who need to finish independent work somewhere may do so. The rest of the pride listens to a story or continues to listen to each other and share their products and experiences of the day.

Note: In the Laboratory School during 1969-1970, pupils learned about the Durham community by dramatizing roles of community workers in a child-size "city." The "city" encompassed an area 100' by 40' in the center of the school building.[1]

Laboratory School teachers taught social studies by capitalizing on the children's natural desire to dramatize adult life. At the beginning of the 1969-1970 school year, the "city" included only a home, store, and post office (institutions which had been studied during the previous school year). As the pupils played in the "city," there was a need for more facilities and buildings (e.g., with the study of the post office and air mail, there was the need for airports). A hospital was added when there were many airplane "crashes." Masking tape roads were marked on the floor in the "city" as small cars and trucks were made in the school shop. A department of motor vehicles was added since pupils needed driver's licenses to drive in the "city." A police department was added since policemen were needed to regulate traffic and help in accidents. By the end of the school year, a bank, fire station, school, restaurant, traffic court, city council, and a launching pad with a rocket ship had been added to the "city."

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[1] The author is indebted to Dr. Loretta Golden for this description of the social studies dramatic play program developed by her in 1969-197.

Approximately once a week 32 pupils (first through third year of school attendance) participated in dramatic play activities. Before the play the children chose roles. The rule in the "city" was to be authentic. Children knew they must be serious and act as real policemen, postmen, pilots, etc. There were no scripts or lines to memorize, but the pupils spontaneously dramatized community life. For example:

1. Student postal clerks picked up the mail from the mail boxes. They cancelled the stamps, sorted the letters, and delivered them to mail boxes outside Laboratory School work stations and classrooms. Airmail was taken in small trucks to the airport where they were loaded onto airplanes. Pupils in the control towers told the pilots when to take off and land, and which runways to use.
2. Since any city has its share of emergencies, there was a hospital where injured people were taken for help. Student policemen were called to accidents to help. Policemen also gave tickets to cars and trucks speeding on the roads in the "city." They walked beats in the "city" and checked the security of the vaults in the bank and store.

3. Mothers cashed checks in the bank, made purchases at the store, and ate at the restaurant.

This was not the unguided play of the playground after school. The teachers observed the dramatic play and noted the children's correct concepts and their misconceptions about community life. They made notes of their need for more social studies information in order to have more accurate play.

A discussion followed each play period. The children told what they did in the city that day and discussed the problems they had and the need for more information and "props." The teacher guided them (by selective attending) to encourage them to seek more information and skills (such as counting change) in order to have more accurate and effective play. In these discussions children evidenced a real involvement in city problems, seldom seen even in older students in conventional junior and senior high schools.

In order to lead the play to higher educational levels, the teachers planned several research lessons before each play period. Filmstrips and movies were scheduled, and books, charts, and teacher-prepared stories were read so the children could gain needed background information for improved dramatic play. Field trips (e.g., to the police station, airport, post office, city council) were planned, not as enrichment activities, but as data gathering activities so that children would gain the knowledge needed to be authentic in their play.

Social studies was scheduled during the first period of the day (following the planning period) since the activities in the "city" created motivations and needs in academic areas. Although there were separate systematic programs of arithmetic and reading instruction, the social studies program provided content for some mathematics, reading, and language arts lessons. Children needed to know how to count change in the store, bank, post office, and airport ticket office. They needed to write letters for use in the post office and make tickets for the airport. Spelling lessons based on vocabulary words related to dramatizations in the city were worked out. Teachers used the language experience approach (to reading) as one way of teaching reading to slow pupils. In the "language-experience" lessons, pupils often wrote stories about what they did in the city during dramatic play.

Activities in the "city" also provided ideas for pupil projects during open laboratory periods (e.g., projects such as making cars and traffic signs in shop; murals in the graphics room; and food for the restaurant in the cooking and sewing room). Children could also choose the "city" itself as a laboratory activity.

Dramatic play in the "city" was an open-ended method of teaching that provided opportunity for success and problem-solving for children of all ability levels - from the slow to the gifted. Using it created an opportunity for boys as well as girls to find involvement and excitement in learning new skills and ideas in a school setting.

CHAPTER THREE

Selection of Experimental and Control Subjects

During the summer of 1965, EIP teachers and social workers (assisted by Operation Breakthrough personnel) conducted door to door surveys in Target Areas A, B, C, and D to identify the names, ages, and addresses of all children under six living in the four areas. From these lists names of children were randomly selected to form the initial pre-kindergarten and kindergarten experimental classes. These samples were drawn from separate lists of boys and girls to provide approximately equal numbers of each sex in the experimental classes. Where target areas were integrated, separate lists of black and white children were used to create random groups with the same ratio of black to white as found living in the community. Only black persons lived in Target Areas A and C. A minority of black children were found living in Target Areas B and D.

After random groups were selected visits by social workers were made to each of the families to enlist the interest and support of the subjects' parents. Almost all of the children in the original samples drawn were effectively enrolled. In the few cases (a total of four or five) where parents were disinterested, opposed, or transient other names were drawn at random from the survey lists to complete the class enrollments.

As attrition during the school year occurred in the pre-kindergarten and kindergarten groups additional subjects were randomly selected from the survey lists to fill the classes. Once the experimental children had reached the age of entry to the primary grades, additions to treatment groups were made in non-random fashion by the school principals in each Target Area.

Those EIP experimental classes which were formed at entry to public school (normally called first grade) were selected non-randomly by the school principals from their own enrollment lists.

In Target Area D (the attendance area of the Laboratory School) the original survey list was insufficient to provide enough subjects to fill the experimental classes. Many houses in the area were torn down during the period 1965-1968 and it was necessary to recruit door to door and solicit referrals for the experimental primary classes in the Laboratory School during 1968-1969 and 1969-1970.

Recruitment of Infant Project subjects was completed at Duke University Medical Center from the daily log of obstetric registrations at Duke University Medical Center. The following criteria were used to select babies for longitudinal study:

1. The baby was normal and healthy at birth,
2. The baby's father and mother maintained a home together,
3. The mother was interested in well-baby care and was eager to take advantage of the services offered by the Project, and
4. The family lived in one of the four Target Areas.

Of the 45 babies observed at birth, 36 were selected for study. Thirty-two of these babies were maintained in the longitudinal study through approximately two years of age. At the end of five years, 22 were enrolled in EIP pre-schools and an additional five were being evaluated as a control group for the group receiving EIP pre-school programs.

Since many different procedures were used to select and educate different groups of experimental subjects each cohort sharing a common method of selection, common age of entry, common length of treatment, common program and sequence of educational intervention, and common sets of teachers and teaching aides was given an identifying alphameric code. Table 12 presents the 32 experimental cohort groups by type of selection made and code number and letter assigned.

Control Subjects

Since both an internal and an external analysis of effects of EIP treatments was planned a variety of control groups was sought. Among the control subjects obtained were the following:

1. Randomly selected members of original survey lists who had never been pre-tested, enrolled in EIP classes, or visited by EIP personnel prior to post-testing in 1970.
2. Subjects chosen randomly from survey lists in matched target areas, pre-tested and tested periodically with the same instruments and according to the same time schedule as the experimental subjects.
3. Members of public school primary classes (first grades) chosen randomly from available classes in matched (or the same) target areas. These subjects were assumed to be non-randomly selected by school principals according to private criteria (in all probability grouped according to expected ability or school readiness).
4. Members of two experimental Follow Through first grade classes chosen randomly from six Follow Through classes available in Durham County. These subjects were chosen by principals according to Follow Through criteria from lists of year-round Head Start children.
5. Members of three public school Follow Through control (first grade) classes selected by school principals according to private criteria from lists of summer Head Start children.
6. Matched Infant Project subjects whose parents were interested in sending their children to EIP pre-kindergartens (and in some cases enrolled them

Table 12

Selection of EIP Experimental Cohort Groups

Community Survey and Random Selection	Recruited by EIP Staff	Parental Referral	Area A Principal
011a	011d	041c	012c
011b	012b	042c	012d
011c	021b	046a	
012a	021c		
021a	032b		
022a	032c		
031a	042a		
032a	042b		
041a	044a		
041b	044b		

Assigned by Area B Principal	Assigned by Area C Principal	Referred by Housing Authority Off.	Infant Project Recruitment
022b	031b	013a	051a
	031c		051b
	031d		

for a month or two) but were unable to make the necessary arrangements to keep them enrolled.

Table 13 presents the experimental and control cohort groups by type of selection. Table 14 matches the control groups with the 32 experimental cohort groups (identified also by serial number). Comparisons made between experimental group means and various control group means on the dependent variables are reported in Chapter Four. These comparisons were made to evaluate effects of EIP treatments in Stanford-Binet I.Q., language development (ITPA), school achievement (MAT), and social skills (CASES).

Numbers of Subjects Originally Enrolled, Graduates, and Dropouts

The numbers of subjects originally enrolled in the various experimental cohorts are given in Table 15. The number from each group who completed the planned educational intervention sequences (Table 15, p. 127) are indicated along with the dates of completion. The number of dropouts and the number who remained in EIP treatment programs beyond the planned sequences are also given.

Numbers of Subjects Entering into an Internal Analysis of Effects of Age of Entry and Length of Treatment

Among the questions of interest regarding early childhood educational intervention are the effects of age of entry to compensatory programs and duration of treatment. Another question of great importance is the stability of treatment effects after termination of treatment. Table 16 presents figures regarding age of entry, length of treatment, and length of post-treatment follow-up for each of the experimental cohort groups. Results of analyses of effects of age of entry and length of treatment and stability of effects over one year of public school experience are given in Chapter Four.

Table 13

Types of Experimental and Control Groups in EIP (1965-1970)

Type of Group	Representative Samples		Non-Representative Samples						
	Randomly Chosen from Target Area Survey Lists of Boys & Girls of Same Age								
	From Target Area Lists[a]	From Matched Area Lists[b]	Infant Project Criteria	Recruited for EIP Door to Door	Selected from Classes Assigned by Principal	Referral by Housing Agency	Summer Head Start	Follow Through	Parental Request
Control Groups	911	111	051c		131		212	244	
	912	112			141		444	312	
	921	121			142		544	811	
	922	122			144			812	
	931				813			824	
	932				826			825	
					839			837	
					681			838	
Experimental Groups	011a		051a	011d	012c	013a			041c
	011b		051b	012b	012d				042c[c]
	011c			021b	022b				046a[c]
	012a			021c	031b				
	021a			032b	031c				
	022a			032c	031d				
	031a			042a					
	032a			042b					
	041a			044a					
	041b			044b					

[a] Final status only was measured for control groups in this column. (No initial or transitional measures were taken as a control for practice effects.)

[b] Matched control groups were randomly selected from lists of boys and girls of comparable age obtained by door to door surveys in neighborhoods similar to EIP Target Areas in SES and racial composition.

[c] Not included in analysis of effects of treatment (middle-class subjects with no controls).

Table 14

Matched Experimental and Control Groups (1965-1970)

Serial Number	Experimental EIP Cohort Group	Matched Control Groups			
		Randomly Selected		Non-Randomly Selected	
		Same Area	Matched Area	Public Class	Follow Through Class
01	011a	911	111,121	212	
02	011b	911	111,121	212	
03	011c	911	111,121	212	
04	011d	911	111,121	212	
05	012a	912	112	212,144	
06	012b	912	112	212,144	
07	012c	912	112	212,144	
08	012d	912	112	212,144	
09	013a	911	111,112,121		
10	021a	921	121,122		
11	021b	921	121,122		
12	021c	921	121,122		
13	022a	922	122	141,142,444,544	
14	022b	922	122	141,142,444,544	
15	031a	931		131 839,826	824,825,312,837,838
16	031b	931		131 839,826	824,825,312,837,838
17	031c	931		131 839,826	824,825,312,837,838
18	031d	931		131 839,826	824,825,312,837,838
19	032a	932	111,112	131,144,839,826	824,825,312,837,838
20	032b	932	111,112	131,144,839,826	824,825,312,837,838
21	032c	932	111,112	131,144,839,826	824,825,312,837,838
22	041a			141,444,544,681,813	811,812,(244 + 312)
23	041b			141,444,544,681,813	811,812,(244 + 312)
24	041c			141,444,544,681,813	811,812,(244 + 312)
25	042a		122	141,142,444,544,813	811,812
26	042b		122	141,142,444,544,813	811,812
27[a]	042c				
28	044a			212,444,544	811,812,(244 + 312)
29	044b			212,444,544	811,812,(244 + 312)
30[a]	046a				
31	051a		051c		
32	051b		051c		

Note: Control groups were matched on C.A., Sex, SES, and ethnicity.

[a] Not included in data analysis (middle-class subjects with no controls).

Table 15

Progress of Cohort Groups in the Durham EIP

Spring 1970

Serial Number	Original Cohort Groups	Orig. recruited/ Enrolled		Completed EIP Sequence in 1970		Completed EIP Sequence before 1970		Left before completing EIP	Stayed in EIP additional yr.	
		N	Date	N	Date	N	Date	N	N	Date
1	011a	9	S 66			4	S 69	3	2	S 70
2	011b	5	F 66			1	S 69	2	2	S 70
3	011c	7	F 67			6	S 69	1		
4	011d	2	F 68			2	S 69			
5	012a	16	F 66	11	S 70			5		
6	012b	1	F 67	1	S 70					
7	012c	12	F 68	10	S 70			2		
8	012d	1	S 69					1		
9	013a	14	F 68	7	S 70			7		
10	021a	10	F 66	7	S 70			3		
11	021b	5	F 67	3	S 70			2		
12	021c	4	F 68	3	S 70			1		
13	022a	12	F 66	7	S 70			5		
14	022b	14	F 67	8	S 70			6		
15	031a	20	F 65			17	S 69	3		
16	031b	6	F 66			4	S 69	1	1	
17	031c	2	F 67			2	S 69			
18	031d	1	S 68			1	S 69			
19	032a	12	F 66			11	S 69	1		
20	032b	3	F 67			3	S 69			
21	032c	2	F 68			2	S 69			
22	041a	15	F 65			7	S 69	8		
23	041b	18	F 66			7	S 69	11		
24	041c	3	F 67			3	S 69			
25	042a	14	F 66	5	S 70			9		
26	042b	14	F 67	10	S 70			4		
27	042c	1	F 69	1	S 70					
28	044a	20	Sum68	10	S 70			10		
29	044b	3	F 68	1	S 70			2		
30	046a	2	F 69	2	S 70					
31	051a	12	F 67	7	S 70			5[a]		
32	051b	24	F 68	15	S 70			9[b]		
Totals		284		108		70		101	5	

[a] 4 dropped out of nursery but in Follow-up = 051c
[b] 1 dropped out of nursery but in Follow-up = 051c

Table 16

EIP Experimental Cohort Group Enrollment, Age of Start of Treatment, Length of Experimental Treatment, and Public School Follow-up

Serial Number	Cohort I. D.	Original Enrollment	End of Treatment Enrollment[a]	No. in effects of Treatment Anal.	Ave. Start Age in Years	Length of EIP Treatment[b]	Length of Post EIP Public School
1	011a	9	4	4	2	3	1
2	011b	5	0	0	3	0	0
3	011c	7	6	6	4	2	1
4	011d	2	2	2	5	1	1
5	012a	16	12	12	4	4	0
6	012b	1	1	1	5	3	0
7	012c	12	9	9	6	2	0
8	012d	1	0	0	6	0	0
9	013a	14	7	7	3	2	0
10	021a	10	10	10	2	4	0
11	021b	5	3	3	3	3	0
12	021c	4	3	3	4	2	0
13	022a	12	7	7	5	4	0
14	022b	14	8	7	6	3	0
15	031a	20	17	17	5	4	1
16	031b	6	4	4	6	3	1
17	031c	2	2	2	7	2	1
18	031d	1	1	1	7	1	1
19	032a	12	12	12	3	3	1
20	032b	3	3	3	4	2	1
21	032c	2	2	2	5	1	1
22	041a	15	7	7	5	4	1
23	041b	18	7	7	6	3	1
24	041c	3	3	3	7	2	1
25	042a	14	5	5	5	4	0
26	042b	14	10	10	6	3	0
27	042c	1	1	0	8	1	0
28	044a	20	11	11	6	2	0
29	044b	3	2	2	6	2	0
30	046a	2	2	0	6	1	0
31	051a	12	7	7	2	3	0
32	051b	24	15	15	2	2	0
Totals		284	183	179			

[a] End of treatment cohort enrollment includes transfers from one experimental cohort to another (subjects were placed in cohort of longest membership).

[b] Length of treatment given in academic years.

Number and Types of Dropouts by Target Area

An analysis of EIP subjects who dropped out during the five-year period (before completing the planned sequence) was made to determine whether selective factors were operating which would render the experimental sample remaining at the end of the planned sequence of treatments unrepresentative of the Durham disadvantaged population. The numbers who dropped out are presented in Table 17 by Target Area (and Infant Project) and reason for leaving (as ascertained by the social work staff). As can be seen large numbers of children dropped out because of moving to a distant location (during urban renewal in Areas A, B, and D begun in 1966) and because of the closing of the public school in Area D (in the summer of 1967).

As a further check on the representativeness of the remaining experimental subjects a one-way analysis of variance was made comparing the demographic characteristics of the experimental subjects with the dropouts and comparing the two groups on a number of family variables.

Table 18 presents results of a one-way analysis of variance comparing 184 experimental EIP subjects with 90 (out of 101) dropouts for whom similar demographic data were available. As can be seen significantly more white subjects dropped out. The dropouts came from smaller families (i.e., had fewer brothers and sisters) and the attrition was greatest in Area D where the Laboratory School had been closed for several months in 1967. Since this school regularly enrolled a large majority of white children, its untimely closing resulted in a systematic loss of white children from the Project.

The experimental subjects came from 149 families, while dropouts represented 82 families (for whom data were available for 71). Table 19 presents results of a one-way analysis of variance comparing various demographic characteristics of

Table 17

Summary of EIP Dropouts by Target Area (1965-1970)

Type of Dropout[1]	TARGET AREA			LAB SCHOOL	Infant	
	A	B	C	D	Project	Totals
1	6	12	4	17	5	44
2	6	3		0		9
3	8	2	1	26	8	45
4				1		1
5	1			0	1	2
Totals	21	17	5	44	14	101

[1] Reasons for attrition coded as follows:

1 - Children who moved to a new address too distant from the EIP school in which they were enrolled.

2 - Children who would have remained in the program except for parental inability to establish satisfactory after-school arrangements for them.

3 - Children who withdrew because their parents preferred a different school program, student population, or location.

4 - Chronic illness.

5 - Children whose reasons for dropping out were unknown by the school social worker.

Table 18

Comparison of EIP Research Sample with Subjects who Dropped Out
(One-way Analysis of Variance)

Variable	t	p	Nature of Difference
Sex	2.119	n.s.	
Group	7.759	$<.001$	more whites dropped out
Year and Month of Birth	1.888	n.s.	
Number of Sisters	1.741	n.s.	
Number of Brothers	3.451	$<.001$	research sample had more brothers
Number of Older Brothers	3.146	$<.01$	research sample had more older brothers
Ordinal Position	4.226	$<.001$	fewer siblings in drop-out group
Child's Legitimacy	.413	n.s.	
Target Areas	2.396	<02	more subjects dropped from the Laboratory School
Year and Term of Entry	.379	n.s.	

Note: Results are based on the following sample sizes:

Experimental subjects in final analysis = 184
Drop-outs (subjects who did not complete treatment) = 101
Drop-outs for whom data were available = 90

Table 19

Comparison of Families of EIP Research Sample with Families of Drop-outs
(One-way Analysis of Variance)

Variable	t	p	Nature of Difference
Total in Family or Household	2.268	<.05	drop-outs had smaller families
Mother's Approximate Year of Birth	2.328	<.05	drop-outs had older mothers
Father's Approximate Year of Birth	.697	n.s.	
Mother's Educational Level	.138	n.s.	
Father's Educational Level	.651	n.s.	
Mother's Warner Scale Occupational Status	3.970	<.001	mothers of drop-outs had higher SES
Father's Warner Scale Occupational Status	2.823	<.01	fathers of drop-outs had higher SES
Mother's Job Stability	1.089	n.s.	
Father's Job Stability	2.380	<.02	drop-outs' fathers had more stable jobs
Marital Status of Parent or Parents	1.447	n.s.	
Family Income	.129	n.s.	
Source of Family Income	3.587	<.001	research sample received more welfare
Percentage Earned by Mother	.078	n.s.	
Percentage Earned by Father	1.641	n.s.	
Family Structure Type	.920	n.s.	
Home Owned	.212	n.s.	
State of House	.995	n.s.	
State of Neighborhood	1.195	n.s.	
Rent per Month	1.198	n.s.	
Mother's Availability to Children	4.116	<.001	mothers of drop-outs were more available

Note: Results are based on the following sample sizes:

Families of EIP subjects in the final analysis = 149
Families of EIP drop-outs = 82
Families of drop-outs for whom data were available = 71

the two sets of families. These results confirm the finding given above that the dropouts came from smaller families. The mothers of the dropouts were significantly older, had higher socio-economic status, and were more likely to be at home (as housewives) and physically available to their children. The fathers of dropouts also had higher socio-economic status than the experimental subjects remaining in the program and had more stable work histories.

In contrast the remaining experimental subjects came from families with a significantly greater amount of welfare support.

These results, taken together, suggest that attrition did not operate to reduce the representativeness of the research sample with respect to the black, disadvantaged community. The smaller number of white subjects remaining in the research sample (and the significantly greater number of white subjects who dropped out) invites caution regarding generalization of results to Durham's white families in Target Area D. However, the white children who remained were apparently more disadvantaged than those who dropped out.

Demographic Characteristics of EIP Subjects and Families

Tables 20 through 40 present demographic EIP subjects and their families by ethnic group and Target Area of original recruitment. Data for subjects recruited from all Target Areas for the Infant Project are given separately.

Relationships between selected family variables and school performance will be examined in subsequent reports.

Table 20

Frequency Distribution of Total Family Income Reported by EIP Mothers (1969)

Family Earnings (all sources)	All Families	Group		Target Area			Lab School	Infant Project
		White	Black	A	B	C		
$7500 or more	18	4	14	4	0	4	5	5
5000 - 7499	36	8	28	3	2	12	10	9
2500 - 4999	66	5	61	16	16	16	9	9
1500 - 2499	28	2	25	13	4	3	7	1
1000 - 1499	0	0	0	0	0	0	0	0
500 - 999	2	0	2	2	0	0	0	0
Less than 500	0	0	0	0	0	0	0	0
Unknown	9	1	8	2	2	1	2	2
Totals	159	21	138	40	24	36	33	26
Means in $	4407	5330	4209	3478	3364	4928	5000	5308

Table 21

Frequency Distribution of Family Income by Source (1969)

Source	All Families	Group		Target Area			Lab School	Infant Project
		White	Black	A	B	C		
1. Father	34	4	30	8	6	8	4	8
2. Mother	8	1	7	4	0	1	2	1
3. Father and Mother	61	12	49	8	6	19	14	14
4. Parents and Relatives	8	0	8	4	2	0	2	0
5. Grandparents	2	0	2	0	0	1	1	0
6. Public Welfare	31	2	29	13	6	3	8	1
7. Public Welfare and Father	3	1	2	1	1	1	0	0
8. Public Welfare and Mother	3	0	3	1	1	0	1	0
9. Other Agencies	5	1	4	1	1	2	1	0
10. Unknown	4	0	4	0	1	1	0	2
Totals	159	21	138	40	24	36	33	26

Table 22

Frequency Distribution of Income Contributions by Father and Mother

	Income Percentage Contributed	All	Group		Target Area			Lab. School	Infant Project
			White	Black	A	B	C		
Father	100 Percent	34	4	30	7	6	9	3	9
	90 - 99	2	0	2	0	0	0	1	1
	80 - 89	10	1	9	1	2	4	2	1
	70 - 79	8	1	7	2	1	1	4	0
	60 - 69	17	3	14	3	0	6	3	5
	50 - 59	24	4	20	2	2	9	5	6
	40 - 49	4	2	2	2	1	0	1	0
	30 - 39	3	1	2	1	0	0	2	0
	20 - 29	2	1	1	0	0	0	1	1
	10 - 19	3	0	3	1	2	0	0	0
	00 - 09	41	2	39	19	8	5	9	0
	Unknown	11	2	9	2	2	2	2	3
	Total	159	21	138	40	24	36	33	26
	Mean Percentage	52.0	54.8	51.6	35.6	46.4	63.7	46.4	75.0
Mother	100 Percent	6	1	5	3	0	1	2	0
	90 - 99	0	0	0	0	0	0	0	0
	80 - 89	4	0	4	1	2	0	0	1
	70 - 79	1	1	0	0	0	0	1	0
	60 - 69	4	0	4	3	0	0	1	0
	50 - 59	14	3	11	4	0	3	3	4
	40 - 49	21	4	17	1	2	8	5	5
	30 - 39	14	1	13	2	1	5	3	3
	20 - 29	7	2	5	2	2	1	2	0
	10 - 19	4	0	4	0	0	2	1	1
	00 - 09	74	8	66	22	15	14	14	9
	Unknown	10	1	9	2	2	2	1	3
	Total	159	21	138	40	24	36	33	26
	Mean Percentage	24.0	29.1	22.5	25.0	14.8	24.2	27.0	26.3

Table 23

Frequency Distribution of Job Stability Ratings for EIP Fathers and Mothers (1969)

Parent	Stability Rating	All	Group		Target Area			Lab. School	Infant Project
			White	Black	A	B	C		
Father									
	1. Stable	89	12	77	19	11	24	19	16
	2. Moderately Stable	25	5	20	9	1	5	5	5
	3. Unstable	6	0	6	0	3	0	1	2
	4. Chronically Unemployed	0	0	0	0	0	0	0	0
	5. Unknown	39	4	35	12	9	7	7	3
	Total	159	21	138	40	24	36	33	26
Mother									
	1. Stable	61	13	48	14	7	20	17	3
	2. Moderately Stable	28	1	27	4	3	6	5	10
	3. Unstable	12	3	9	0	4	0	5	3
	4. Chronically Unemployed	1	0	1	0	1	0	0	0
	5. Unknown	57	4	53	22	9	10	6	10
	Total	159	21	138	40	24	36	33	26

Table 24

Frequency Distribution of Parents and Parent-Substitutes Who

Completed Various Levels of Schooling (as of 1969)

Level of Education	All		White		Black		Target Area						Lab. School		Infant Project	
							A		B		C					
	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M
College Grad.	3	2	1	1	2	1	1	0	0	0	1	0	1	2	0	0
Part College	8	11	0	0	8	11	3	4	0	0	3	5	2	0	0	2
H. S. Grad.	25	38	0	5	25	33	4	7	3	4	7	8	1	6	10	13
Part H. S.	33	43	5	5	29	38	8	15	5	4	5	10	7	9	8	5
Elem. or less	52	58	4	9	38	49	7	10	11	14	13	13	15	15	6	6
Unknown	38	7	2	1	36	6	17	4	5	2	7	0	7	1	2	0
Totals	159	159	21	21	138	138	46	40	24	24	36	36	33	33	26	26
Means (grade level)	9.0	10.0	8.0	9.7	10.0	10.0	10.8	10.4	8.0	9.0	9.7	9.6	8.8	9.9	10.3	11.0

Table 25

Frequency Distribution of Occupational Status (Warner Scale) of EIP Fathers and Mothers (1969)

Warner Scale of Occupat. Status	All		Group				Target Area						Lab School		Infant Project	
			White		Black		A		B		C					
	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M
1	2	0	1	0	1	0	1	0	0	0	0	0	1	0	0	0
2	1	2	0	0	1	2	0	0	0	0	1	1	0	1	0	0
3	3	3	2	0	1	3	0	0	0	0	1	2	2	0	0	1
4	26	9	2	4	24	5	3	3	0	0	10	1	6	4	7	1
5	27	27	10	4	26	24	10	4	5	3	6	6	1	5	5	9
6	77	72	14	11	63	61	18	18	16	13	14	21	18	15	11	5
7	9	32	0	3	9	29	6	14	1	7	0	3	2	8	0	0
Unknown	14	14	1	0	13	14	2	1	2	1	4	2	3	0	3	10
Totals	159	159	21	21	138	138	40	40	24	24	36	36	33	41	26	26
Means	5.4	5.8	5.2	5.7	5.4	5.8	5.6	6.1	5.8	6.2	5.0	5.5	5.3	5.7	5.2	5.1

Table 26

Frequency Distribution of Mothers' Physical Availability for Child Rearing

(as estimated on the basis of number and type of activities undertaken)[a]

Activities Undertaken	All Mothers	Group		Target Area			Lab School	Infant Project
		White	Black	A	B	C		
1. Full time homemaker	59	7	52	17	13	7	11	11
2. Employed at home	2	0	2	0	0	0	1	1
3. Part-time homemaker, employed half-time	7	2	5	2	0	0	3	2
4. Full time employment, rotating shift	8	2	6	3	0	2	3	0
5. Part-time employment, handicapped	3	0	3	1	0	2	0	0
6. Full time employment	61	8	53	12	6	21	12	10
7. Full time student	2	2	0	0	0	0	2	0
8. Part-time employment, part-time training	2	0	2	0	1	1	0	0
9. Independent business away from home	2	0	2	0	1	0	1	0
10. Full time employment, split shifts	1	0	1	0	0	0	0	1
11. Full time employment and in training	1	0	1	1	0	0	0	0
12. Full time employment requiring travel	3	0	3	1	0	1	0	1
13. Employment full time with evening activities	3	0	3	0	1	2	0	0
14. Two full time jobs	0	0	0	0	0	0	0	0
Unknown	5	0	5	3	2	0	0	0
Total	159	21	138	40	24	36	33	26
Means (physical availability)	4.2	4.0	4.2	3.6	3.6	5.5	3.9	3.9

[a] Items in scale were selected from EIP case histories and ranked by six professional social workers according to probable availability to children in the home.

Table 27

Frequency Distribution of Types of EIP Family Structures

	All Families	Group		Target Area			Lab School	Infant Project
		White	Black	A	B	C		
1. Intact nuclear	96	14	82	16	13	29	17	21
2. Intact extended	6	1	5	1	1	0	1	3
3. Mother divorced or separated, living alone with children	26	5	21	10	6	1	9	0
4. Mother divorced or separated, living with relatives	14	1	13	3	3	2	5	1
5. Mother and illegitimate child (children) living with relatives	6	0	6	6	0	0	0	0
6. Mother and illegitimate child (children) living alone	4	0	4	2	0	0	1	1
7. Common-law marriage	0	0	0	0	0	0	0	0
8. One parent deceased, widowed parent caring for children	0	0	0	0	0	0	0	0
Unknown	7	0	7	1	1	4	0	0
Totals	159	21	138	40	24	36	33	26

Table 28

Frequency Distribution of Marital Status of Mothers of EIP Experimental Subjects

Marital Status	All Mothers	Group		Target Area			Lab School	Infant Project
		White	Black	A	B	C		
1. Single	15	0	15	11	0	0	1	3
2. Married	99	15	84	15	14	29	20	21
3. Divorced	4	2	2	13	3	0	1	0
4. Separated	35	4	31	0	6	3	11	2
5. Widowed	5	0	5	1	0	4	0	0
Unknown	1	0	1	0	1	0	0	0
Totals	159	21	138	40	24	36	33	26

Table 29

Frequency Distribution of EIP Family Size

Family Size[a]	All Families	Group		Target Area			Lab. School	Infant Project
		White	Black	A	B	C		
2	2	0	2	2	0	0	0	0
3	13	2	11	4	1	2	4	2
4	27	6	21	8	1	4	6	8
5	17	2	15	5	0	3	4	5
6	30	4	26	4	6	12	3	5
7	15	1	14	5	4	2	3	1
8	17	4	13	3	5	5	3	1
9	9	1	8	1	2	2	4	0
10	9	0	9	4	2	2	1	0
11	10	1	9	0	1	3	4	2
12	4	0	4	1	0	1	0	2
13	1	0	1	1	0	0	0	0
14	3	0	3	2	1	0	0	0
15-17	1	0	1	0	0	0	1	0
Unknown	1	0	1	0	1	0	0	0
Totals	159	21	138	40	24	36	33	26
Means	6.7	5.9	6.8	6.5	7.6	6.8	6.8	6.0

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[a] Size is expressed as the total number of persons regularly residing in the household.

Table 30

Frequency Distribution of Ages of Parents of EIP Children

(1969)

Age of Parents (or Caretakers)	All Parents		Group				Target Area						Lab. School		Infant Project	
			White		Black		A		B		C					
	F[a]	M[b]	F	M	F	M	F	M	F	M	F	M	F	M	F	M
80-85 years	1	1	0	0	1	1	0	0	0	0	1	1	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70-74	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
65-69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60-64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55-59	2	1	1	0	1	1	0	1	0	0	1	0	1	0	0	0
50-54	2	1	0	0	2	1	0	0	0	0	1	0	2	1	0	0
45-49	14	5	1	0	13	5	2	0	2	0	6	3	3	2	1	0
40-44	21	19	2	4	19	15	3	3	6	7	6	3	3	5	3	1
35-39	21	19	12	4	13	15	3	3	4	2	3	7	7	5	4	2
30-34	25	32	4	5	21	27	6	6	2	5	6	11	6	3	5	7
25-29	34	50	3	6	31	38	8	10	4	4	4	9	4	11	10	10
20-24	10	28	0	1	10	27	3	13	3	4	0	1	2	4	2	6
15-19	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Unknown	28	8	2	1	26	7	14	3	3	2	5	1	5	2	1	0
Totals	159	159	21	21	138	138	40	40	24	24	36	36	33	33	26	26
Means (C.A.)	35	27	37	33	34	32	34	28	35	34	40	35	33	33	32	30

[a] F = Father (or grandfather or other male caretaker)

[b] M = Mother (or grandmother or other female caretaker)

Note: When father or mother was not present in the home the age of the parent substitute was given. In some cases grandmothers and grandfathers were caretakers.

Table 31

Frequency Distribution of Estimates of Family Social Functioning

Area of Family Functioning	Rating	All Families	Group		Target Area			Lab. School	Infant Project
			White	Black	A	B	C		
Overall Safety	5-Adequate	93	11	82	15	11	26	20	21
	3-Marginal	42	5	37	14	8	10	6	4
	1-Inadequate	9	2	7	1	3	0	4	1
	Unknown	15	3	12	10	2	0	3	0
	Means	4.2	4.0	4.2	4.0	3.7	4.4	4.1	4.5
Family Unity	5-Adequate	85	9	76	14	9	27	14	21
	3-Marginal	39	8	31	8	11	5	11	4
	1-Inadequate	7	1	6	1	1	0	4	1
	Unknown	28	3	25	15	3	4	4	0
	Means	4.1	3.9	4.1	3.7	3.8	4.5	3.7	4.5
Family Behavior and Adjustment	5-Adequate	101	9	92	19	13	32	16	21
	3-Marginal	40	9	31	12	9	3	12	4
	1-Inadequate	3	0	3	0	0	1	1	1
	Unknown	15	3	12	9	2	0	4	0
	Means	4.4	4.0	4.4	4.2	4.2	4.7	4.0	4.5
Care and Training of Children	5-Adequate	91	11	80	16	12	27	18	18
	3-Marginal	48	7	41	14	9	9	10	6
	1-Inadequate	4	0	4	1	1	0	1	1
	Unknown	16	3	13	9	2	0	4	1
	Means	4.2	4.2	4.2	4.0	4.0	4.5	4.2	4.4

Note: Data presented in this table are based on the "Environmental Participation Index" developed by Harold Mathis and published by Psychometric Studies, Washington, D. C., 1967. The ratings used here are defined as:

Inadequate: the community has a right to intervene
Marginal: family functioning is less than adequate but intervention is unwarranted
Adequate: family functioning is in line with community standards

Table 31 (continued)

Area of Family Functioning	Rating	All Families	Group		Target Area			Lab. School	Infant Project
			White	Black	A	B	C		
Social Activities	5-Adequate	104	9	95	21	11	31	18	23
	3-Marginal	37	8	29	10	11	5	8	3
	1-Inadequate	3	1	2	0	0	0	3	4
	Unknown	15	3	12	9	2	0	4	0
	Means	4.4	3.8	4.5	4.4	4.0	4.7	4.0	4.8
Economic Practices	5-Adequate	89	8	81	18	12	29	11	19
	3-Marginal	49	9	40	13	5	7	17	7
	1-Inadequate	7	1	6	0	5	0	2	0
	Unknown	14	3	11	9	2	0	3	0
	Means	4.1	3.8	4.2	4.2	3.6	4.6	3.6	4.5
Household Practices	5-Adequate	96	11	85	19	15	26	15	21
	3-Marginal	37	6	31	10	6	6	10	5
	1-Inadequate	11	1	10	2	1	4	4	0
	Unknown	15	3	12	9	2	0	4	0
	Means	4.2	4.1	4.2	4.1	4.3	4.2	3.8	4.6
Health Conditions and Practices	5-Adequate	102	11	91	28	10	27	15	22
	3-Marginal	47	7	40	9	12	9	13	4
	1-Inadequate	2	1	1	0	0	0	2	0
	Unknown	8	2	6	3	2	0	3	0
	Means	4.3	4.1	4.4	4.5	3.9	4.5	3.9	4.7
Relationships with School Social Worker	5-Adequate	109	11	98	26	13	32	14	24
	3-Marginal	35	7	28	5	9	4	15	2
	1-Inadequate	1	0	1	0	0	0	1	0
	Unknown	14	3	11	9	2	0	3	0
	Means	4.5	4.2	4.5	4.7	4.2	4.8	3.9	4.8

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Table 31 (continued)

Area of Family Functioning	Rating	All Families	Group		Target Area			Lab. School	Infant Project
			White	Black	A	B	C		
Use of Community Resources	5-Adequate	102	10	92	21	9	29	18	25
	3-Marginal	39	8	31	8	11	7	12	1
	1-Inadequate	4	0	4	2	2	0	0	0
	Unknown	14	3	11	9	2	0	3	0
	Means	4.4	4.1	4.4	4.2	3.6	4.6	4.2	4.9

Table 32

Frequency Distribution and Percentage of Home Ownership

(1969)

Family Group	Total	Buying (or owning)		Renting		Unknown	
	N	N	%	N	%	N	%
All Families	159	9	3.6	148	93.1	2	1.3
Group:							
White Families	21	0	0.0	21	100.0	0	0.0
Black Families	138	8	5.8	127	92.0	3	2.2
Target Area Families:							
A	40	2	5.0	37	92.5	1	2.5
B	24	0	0.0	24	100.0	0	0.0
C	36	2	5.5	34	94.5	0	0.0
Laboratory School Families	33	0	0.0	33	100.0	0	0.0
Infant Project Families	26	5	19.3	21	80.7	0	0.0

Table 33

Frequency Distribution and Percentages of Ratings of Housing Conditions

(1969)

		Rating of Housing[a]												
	Total	1-Very Good		2-Good		3-Fair		4-Poor		5-Very Poor		Unknown		Mean Rat-ing
Family Group	N	N	%	N	%	N	%	N	%	N	%	N	%	
All Families	159	11	6.8	54	34.0	52	32.6	31	19.5	8	5.3	3	1.8	2.8
Group:														
White	21	0	0.0	9	42.8	6	28.6	6	28.6	0	0.0	0	0.0	2.8
Black	138	11	8.0	45	32.6	46	33.3	25	18.1	8	5.8	3	2.2	2.8
Target Areas:														
A	40	3	7.5	11	27.5	15	37.5	8	20.0	1	2.5	2	5.0	2.9
B	24	0	0.0	10	41.7	6	25.0	5	20.8	2	8.3	1	4.2	2.8
C	36	3	8.3	15	41.6	11	30.7	7	19.4	0	0.0	0	0.0	2.5
Laboratory School	33	0	0.0	11	33.3	15	45.5	7	21.2	0	0.0	0	0.0	3.0
Infant Project	26	5	19.3	7	26.9	5	19.2	4	15.4	5	19.2	0	0.0	2.9

[a] Criteria: 1) Degree of safety, 2) degree of sanitation, 3) adequacy of space in home for family activities, 4) adequacy of play area, and 5) attractiveness of house.

Table 34

Frequency Distribution of Monthly Rent

Monthly Rent in Dollars	All Families	Group		Target Area			Lab School	Infant Project
		White	Black	A	B	C		
120-129	2	0	2	0	0	0	1	1
110-119	0	0	0	0	0	0	0	0
100-109	1	0	1	1	0	0	0	0
90-99	2	1	1	0	0	1	1	0
80-89	1	0	1	1	0	0	0	0
70-79	7	0	7	3	2	1	1	0
60-69	10	2	8	2	1	0	4	3
50-59	16	5	11	3	5	0	5	3
40-49	36	6	30	14	6	3	7	6
30-39	18	2	16	4	3	2	6	3
20-29	7	0	7	2	0	1	3	1
10-19	4	2	2	2	0	0	2	0
0-9	2	0	2	2	0	0	0	0
Unknown	53	3	50	6	7	28	3	9
Totals	159	21	138	40	24	36	33	26
Means in (dollars per mo.)	43.8	43.3	44.3	41.1	45.8	45.0	43.6	47.1

Table 35

Frequency Distribution and Percentages of Ratings of Neighborhood Conditions

(1969)

Family Group	Total	Rating of Neighborhood[a]												Mean Rating
		1-Very Good		2-Good		3-Fair		4-Poor		5-Very Poor		Unknown		
	N	N	%	N	%	N	%	N	%	N	%	N	%	
All Families	159	5	3.2	43	27.0	74	46.5	27	17.0	7	4.4	3	1.9	2.9
Group:														
White	21	0	0.0	9	42.9	9	42.9	2	9.5	1	4.8	0	0.0	2.8
Black	138	5	3.6	34	24.6	65	47.1	25	18.1	6	4.4	3	2.2	3.0
Target Areas:														
A	40	1	2.5	10	25.0	12	30.0	12	30.0	3	7.5	2	5.0	3.2
B	24	0	0.0	8	33.3	13	54.2	2	8.3	0	0.0	1	4.2	2.7
C	36	3	8.3	9	25.0	21	58.4	3	8.3	0	0.0	0	2.5	2.6
Laboratory School	33	0	0.0	10	30.4	16	48.4	6	18.2	1	3.0	0	0.0	3.1
Infant Project	26	1	3.8	6	23.1	12	46.2	4	15.4	3	11.5	0	0.0	3.1

[a] Criteria: 1) Degree of safety, 2) degree of sanitation, 3) adequacy of space for family activities, 4) adequacy of play areas in neighborhood, 5) attractiveness of neighborhood, 6) condition of streets (paved, graveled, or dirt), and 7) presence (or absence) of a recreational area.

Table 36

Frequency Distribution of Ages of EIP Subjects

(as of July 1, 1969)

Age	All EIP Subjects	Group		Target Area			Lab School	Infant Project
		White	Black	A	B	C		
3	10	0	10	0	0	0	0	10
4	23	0	23	8	0	0	0	17
5	14	0	14	2	12	0	0	0
6	29	0	29	14	1	14	0	0
7	30	2	28	17	0	2	11	0
8	32	9	23	7	12	1	12	0
9	36	10	26	0	2	18	16	0
10	9	1	8	0	0	6	3	0
11	1	0	1	0	0	0	1	0
Unknown	0	0	0	0	0	0	0	0
Totals	184	22	162	46	27	41	43	27
Mean Age	6.2	8.1	7.0	6.4	6.2	6.2	8.1	3.1

Table 37

Frequency Distribution of the Number of Brothers and Sisters of EIP Subjects

	All Subjects	Group		Target Area			Lab. School	Infant Project
		White	Black	A	B	C		
Brothers:								
None	35	4	2	11	2	5	7	11
1	43	7	36	8	3	14	9	9
2	44	7	37	9	11	11	11	2
3	23	2	21	6	5	3	7	2
4	16	2	14	5	2	4	3	2
5	12	0	12	2	3	3	3	1
6	4	0	4	1	0	1	2	0
7	2	0	2	1	0	0	1	0
8	2	0	2	2	0	0	0	0
Unknown	2	0	2	1	1	0	1	0
Mean	2.1	1.6	2.2	2.3	2.4	2.0	2.3	1.2
Sisters:								
None	37	6	31	14	1	7	7	8
1	44	5	39	14	6	10	8	6
2	42	5	37	8	7	11	10	6
3	24	3	21	2	4	7	9	2
4	24	2	22	6	7	3	4	4
5	3	0	3	0	0	2	0	1
6	4	1	3	0	0	1	3	0
7	1	0	1	1	0	0	0	0
8	1	0	1	0	0	0	1	0
9	1	0	1	0	1	0	0	0
10	1	0	1	0	0	0	1	0
Unknown	2	0	2	1	1	0	0	0
Mean	2.0	1.7	2.1	1.5	2.7	2.0	2.5	1.7

Table 38

Frequency Distribution of Ordinal Position of EIP Subjects

Ordinal Position	All EIP Subjects	Group		Target Area			Lab. School	Infant Project
		White	Black	A	B	C		
1	38	5	33	11	3	8	9	7
2	26	3	23	7	1	4	6	8
3	26	5	21	5	2	10	7	2
4	26	5	21	5	4	4	9	4
5	23	2	21	8	6	5	2	2
6	16	1	15	4	3	3	5	1
7	10	0	10	3	2	4	1	0
8	8	1	7	3	2	1	1	1
9	3	0	3	0	0	2	1	0
10	3	0	3	0	1	0	0	2
11	1	0	1	0	0	0	1	0
12	2	0	2	0	1	0	1	0
Unknown	2	0	2	0	2	0	0	0
Mean	3.9	3.2	4.0	3.7	5.1	3.9	3.9	3.3

Table 39

Frequency Distribution of Legitimate and Illegitimate Children in EIP Sample

	All EIP Subjects	Group		Target Area			Lab. School	Infant Project
		White	Black	A	B	C		
Legitimate	164	21	143	35	25	37	40	27
Illegitimate	17	1	16	10	1	3	3	0
Unknown	3	0	3	1	1	1	0	0
Total	184	22	162	46	27	41	43	27

Table 40

Frequency Distribution of Entry into EIP Programs by Year and Term

Date of Entry	All	Group		Target Area			Lab. School	Infant Project
		White	Black	A	B	C		
Fall 1965	24	3	21	0	0	17	7	0
Spring 1966	4	0	4	4	0	0	0	0
Fall 1966	55	10	45	16	12	16	11	0
Spring 1967	0	0	0	0	0	0	0	0
Fall 1967	47	7	40	7	11	5	13	11
Spring 1968	1	0	1	0	0	1	0	0
Summer 1968	11	2	9	0	0	0	11	0
Fall 1968	42	0	42	19	4	2	1	16
Spring 1969	0	0	0	0	0	0	0	0
Fall 1969	0	0	0	0	0	0	0	0
Spring 1970	0	0	0	0	0	0	0	0
Unknown	2	0	2	0	0	0	0	0
Total	184	22	162	46	27	41	43	27

CHAPTER FOUR

Results of the Five-Year Project

The stated goals of EIP were diverse and multiple. An effective evaluation of the Project required consideration of the full range of purposes and an examination of short-term effects, as well as any residual, long-term results.

Because of the variety of objectives in the Project a number of approaches to evaluation were taken. An outside educational research institution, the Educational Testing Service of Princeton, New Jersey, was contracted to provide an assessment of the impact of EIP in the Durham community and region. The ETS report was comprehensive and examined all phases of the Project in terms of the broad goals outlined on pages 3-7 in this report. It is presented as Appendix C in Volume II of this report.

A second approach was to invite an outside educator, in this case an experienced school superintendent, to visit the model system in the fifth year of the Project to gather information regarding the quality of the educational program and the possible usefulness and generalizability of the experimental treatments in school settings outside the Durham area. This evaluation is included as Appendix D.

As was discussed earlier (Chapter Two) a third approach was to conduct a series of short-term, special, single case and matched group studies examining the effects of specific interventions with subjects drawn from the Laboratory School population. Many novel treatment programs were evaluated in this fashion and are reported in Volume III of this report. Since little was known regarding the developmental characteristics of disadvantaged children in Durham, several special studies were also made to provide descriptive information without any attempt to modify development or behavior. An extensive, long-term effort was made in the Infant Project, under Donald Stedman's direction, to provide developmental data from birth through two years of age prior to educational intervention and in combination with intervention from two years up to five years and beyond. A comprehensive, separate report of the Infant Project is forthcoming under Donald Stedman's direction. The effects of the pre-kindergarten educational interventions on social behavior (using CASES as a measuring device) and intellectual performance (using the Stanford-Binet) of the Infant Project children are, however, given in subsequent sections of this chapter.

The main focus of evaluation in this volume is on internal analysis and on selective comparisons with control groups. Four bodies of data were selected for analysis and presentation in this chapter:

1. Scores on social behavior in school settings (CASES coefficients for Styles E and F),
2. Measures of academic achievement (scores on the MAT sub-tests),
3. Individual tests of intelligence (Stanford-Binet, WISC, or WPPSI I.Q. scores), and
4. Measures of language development (ITPA Language Ages).

Data obtained from other instruments such as the Preschool Attainment Record (PAR) will be reported in subsequent articles. Relationships between changes in selected dependent variables and variations in the subjects' environmental conditions (home and family variables) will also be examined in later reports.

Evaluation Questions

Several questions posed earlier (Spaulding, 1970) are relevant here. Among these are the following:

1. What are the relative effects of intervening at age 2 in comparison to enrolling children at ages 3, 4, 5, or 6 (on social skills, intellectual development, language development, or later academic performance)?
2. What are the relative effects of variations in length of EIP treatment? That is, does one year of EIP pre-school experience result in less improvement (or greater loss) than two years? or three years? etc.
3. Is there an interaction between age of entry to EIP programs and length of treatment? That is, do children who enter early and stay longer perform more effectively than those who enter at later ages and remain for only a year or two?
4. What is the pattern of change before, during, and after EIP intervention? Are gains (in social skills, I.Q., language performance, or academic skills) made uniformly throughout the treatment period? Are losses in I.Q. present in the EIP population prior to intervention and, if so, are such trends terminated, reversed, or modified by the treatment?

Hypotheses

In previous sections of this report and in published progress reports on EIP (Spaulding, 1970) the following hypotheses were made:

1. The effect of EIP social behavior modification treatments will be to increase obedient, conforming behavior (CASES Style E) in teacher directed settings.
2. The effect of EIP social behavior modification treatments will be to increase independent, productive, assertive behavior (CASES Style F) in non-teacher directed settings.

3. The effect of EIP educational programs will be to improve the intellectual performance of Project pupils to the point where the distribution of Stanford-Binet I.Q. scores approximates the national norm (that is, a mean of 100 and a standard deviation of 16).
4. The effect of EIP educational programs will be to improve the academic performance of pupils to the point where, by the end of the third year of the ungraded primary the distribution of achievement scores on the Metropolitan Achievement Test (MAT), Elementary Form, will equal or exceed the national norms for the test.
5. Pupils who complete the third year of the EIP ungraded primary will earn higher grades in public schools than matched control pupils.
6. EIP children who have completed the third year of the ungraded primary will show more desirable classroom behavior (specifically Style E behavior in teacher-directed settings and Style F in non-teacher directed classroom settings) than control children who have not experienced EIP programs.

Comparisons with randomly selected and matched control groups were made to test these hypotheses. In some cases (e.g., in comparisons regarding post-treatment public school classroom behavior and public school grades) inadequately matched controls - the subjects' public school classmates - were employed as the best comparison groups available.

Effects of EIP Programs

A very large amount of data has been gathered during the five years on the experimental subjects and their various controls. In order to provide an overview of the major findings the results obtained for social behavior (CASES Styles coefficients), intelligence (Stanford-Binet, WPPSI, and WISC I.Q.s), academic achievement (MAT Subtest scores), and language performance (ITPA, Total Language Age) are presented separately by dependent variable and target area. Tables are followed by figures displaying the same data in graphic form.

A standard legend (Table 41, p. 162) has been used in preparing each figure. Separate symbols are used to designate sex, ethnic identity, and treatment condition (whether experimental or control).

In addition to the symbols given in the legend each group (experimental or control) is labeled on the figure itself to identify the group EIP identification number (and letter if appropriate) and the number of subjects present in the group at the end of the treatment period. Subjects who dropped out prior to completion of the planned intervention were omitted from the tables and figures. The tables and figures represent, therefore, longitudinal data on groups of subjects (with dropouts omitted).

Effects of EIP Treatments on Classroom Social Behavior

The behavior of individual pupils can be categorized and evaluated in specific school settings by coding the relevant environmental variables. A coding system was worked out, based on the model given in Figure 6.

Each setting was categorized in terms of five degrees of classroom freedom, the input receptors to be used in learning, the process the teacher expected the pupils to use, and the outputs planned by the teacher. Degrees of freedom were assigned after each observation session and were based upon the limits, goals, and expectations set by the teacher during the session. If standard routines were followed by a teacher the expectations set in previously observed sessions of the same type were used to code the degrees of freedom for the current session.

Table 41

Standard Legend Used on All Figures

Sex Code

△	Boys
○	Girls
□	Boys and Girls

Group Code

▲ ● ■	Black
△ ○ □	White
◭ ◐ ◪	Black and White
▲——▲	Experimental Groups, First digit 0
◬- - -◬	Control Groups, First digit 1-9

Alphameric Code for Group Identification

Example:

031a (17) = Experimental group 031a
with an N of 17

Norm for tests: —·—·—

Exit point from EIP (where applicable) = E

Data on "graduates" from EIP (where applicable) = G

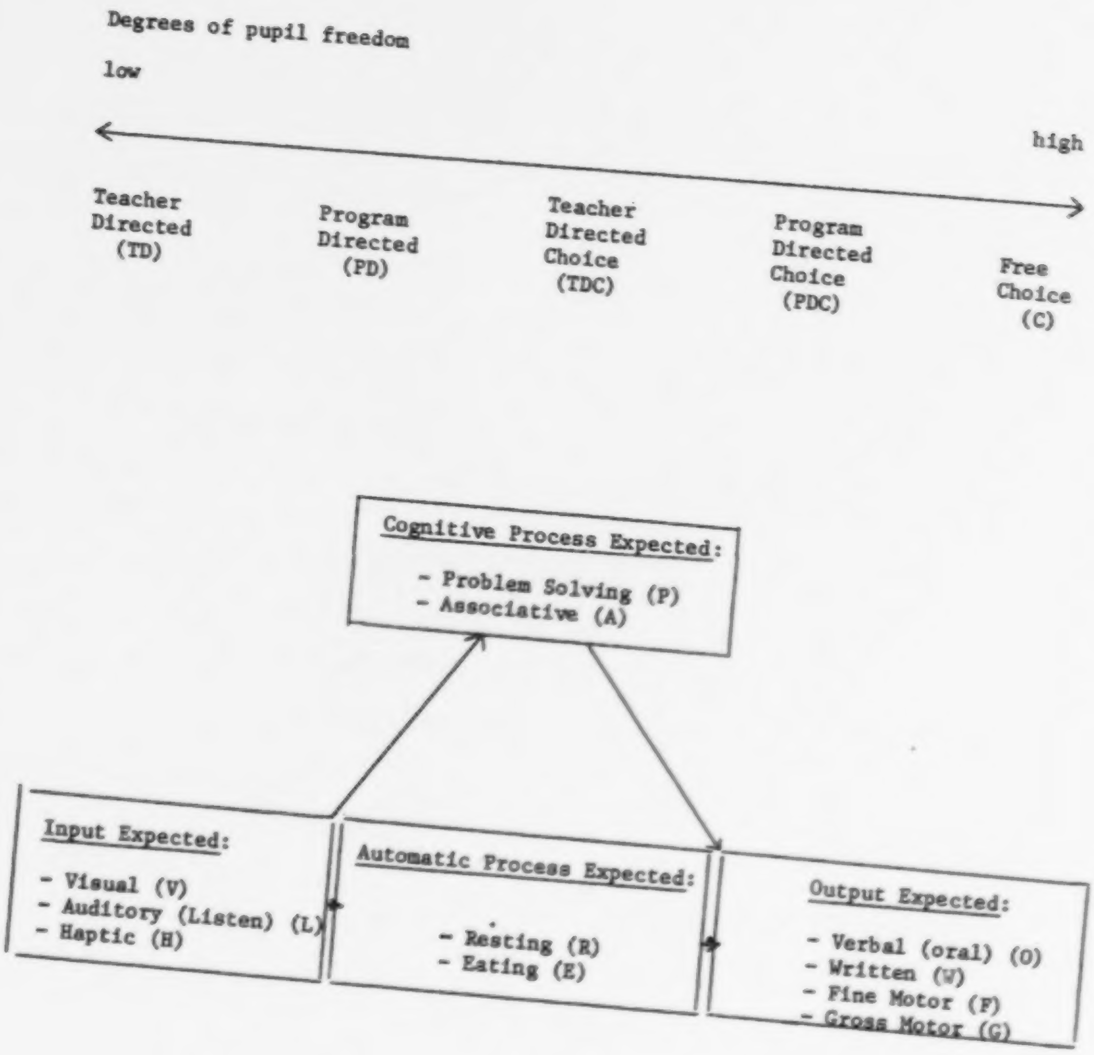
Degrees of pupil freedom
low
high
Teacher Directed (TD)
Program Directed (PD)
Teacher Directed Choice (TDC)
Program Directed Choice (PDC)
Free Choice (C)
Cognitive Process Expected:
- Problem Solving (P)
- Associative (A)
Input Expected:
- Visual (V)
- Auditory (Listen) (L)
- Haptic (H)
Automatic Process Expected:
- Resting (R)
- Eating (E)
Output Expected:
- Verbal (oral) (O)
- Written (W)
- Fine Motor (F)
- Gross Motor (G)

Fig. 6 . Model of Classroom Variables.

Examples of Classification of Common Classroom Sessions in Terms of Degrees of Freedom

1. Teacher Directed (TD)
    a. Directed lessons where pupils were following instructions step by step.
    b. Expository lessons where facts, principles, generalizations, goals, limits, etc., were being stated.
    c. Recitation sessions where pupils were responding to direct questions or were reciting information while others waited their turns - under direct control of the teacher.
    d. Discussion sessions where students talked about topics introduced by the teacher and where no choice was given to the pupils regarding the general topic discussed.
2. Program Directed (PD)
    a. Situations where programmed work sheets were being read and filled in (e.g., IPI, spelling, handwriting).
    b. Listening to tapes prepared by teachers and responding to taped instructions or cues.
    c. Situations where students worked on programmed (written) materials or board work while the teacher moved about reinforcing and assisting.
3. Teacher Directed Choice (TDC)
    a. This category was used to designate an inductive or discovery type of lesson where alternative ways of solving problems were elicited and discussed.

   b. An example is a lesson involving use of rods in solving math problems where students were encouraged to take their own approaches to solving the problems given them by the teacher.

   c. It also was used to designate a teacher-led discussion of pupils' ideas - such as planning by students for dramatic play or discussion of individual student reactions to a field trip.

4. Program Directed Choice (PDC)

   a. The teacher had a definite set of expectancies. Pupils were expected to be engaged in one or another of several learning activities. These were planned, in part, by the teacher in advance. There was a definite program of activities, but the program permitted the students to make many choices about how they would participate. They were expected to complete a set of tasks, or to get involved in educational activities in some manner, but the particular path taken or pattern of involvement was left to the individual to decide.

   b. The teacher was frequently involved, too. But her role was primarily one of reinforcing performance and being available as a resource at the request of the pupils.

Coding Teacher Expectations Regarding Data Inputs, Processing, and Outputs

After the observers coded the degrees of freedom set by the teacher, they identified the receptors expected to be used by the pupils in each session. The expected cognitive, motoric, or automatic processing and output modalities were also determined.

The following guidelines were used in establishing expected inputs, processes, and outputs:

Input Expected - Visual (V), Auditory (L - Listening), Haptic (H):

1. Input was coded when learning was intended by the teachers through participation in an activity scheduled by the teachers.
2. H (Haptic) was assigned if touch and manipulation (including kinesthetic feedback) were required in a manner fundamental to the learning (skill development or concept development) expected by the teacher. If vision was required to learn what was expected, V was assigned. If sound perception was required to learn what was expected, L (Listen) was used.
3. Input codes were omitted when no specific learning was intended.
4. Inputs were not coded when learning was incidental to a free choice activity.

Process Expected - Cognitive Learning, Motoric Learning, or Automatic

1. (P) Problem Solving

   P was scored when problem solving was the main cognitive learning activity expected. That is, P was assigned when pupils were expected to elaborate or transform the data supplied by the teacher (or by the activity itself) and achieve a concept or principle which was evident in the overt responses of the children.
2. (A) Associative Learning

   A was scored when the main learning expected was motoric or of the paired associate type. That is, when names were to be learned, or when counting, spelling, rules, whole words, etc., were to be memorized in a rote fashion, A was used. A was also used for intentional visual-motor-training such as learning to form letters or build with blocks or rods. A was scored whenever memory or skill improvement was the main expected outcome of the learning activity.

3. When no learning was expected, that is, when only the use of previously learned skills, facts, concepts, principles, or generalizations was expected, no cognitive or motoric process code was employed. The process was considered automatic. If learning took place incidentally and was not specifically intended by the teacher, neither P nor A was assigned. The cognitive and motoric learning process coding was left out.
4. Eating was considered an automatic process and was coded E.
5. Rest was designated as an automatic process and was coded R.

Output Expected - Oral (O), Written (W), Fine Motor - exclusive of writing (F), and Gross Motor (G):

1. The appropriate letter was assigned to indicate the manner in which the pupils were expected to behave in completing their assignments, activities, tasks, or problems.
2. In free settings all expressive or motor behavior normally expected in the particular environment for the age of children in question was scored. That is, on a nursery school playground during free play such activities as talking (O), digging in the sand (F, G), running (G), and swinging (G) were normally expected and the appropriate codes were assigned.

Setting variables such as these were found to cut across subject-matter areas. Some teachers taught reading in a highly directed manner with the expectation that pupils would pay attention, watch, listen, associate, and later recite, utilizing the concepts expressed verbally by the teacher during the reading lesson. Other teachers used non-directive, programmed reading materials, and met with pupils in small groups to discuss content informally. These differences were reflected in the setting codes and a variety of content areas were subsumed under one classroom instructional pattern. The CASES Styles data presented in Tables 42 through 51 are organized by degrees of classroom freedom set by the teacher and represent observations made in many subject matter areas from the preschool through the third year of the EIP ungraded primary (and beyond in the case of the followup of EIP graduates in the fourth grade of public school).

Results Regarding Conforming (Style E) and Independent Productive Behavior (Style F)

Data for Style E in teacher directed settings and Style F in program directed settings are given here since these data are directly related to the research hypotheses. The experimental EIP treatments were hypothesized to increase Style E behavior in teacher directed settings and increase Style F behavior in program directed settings.

The findings for Styles A through D (and Styles E and F) in a variety of school settings will be reported in subsequent articles.

Tables 42 through 46 and figures 7 through 11 present CASES coefficients for Style E in teacher directed settings. Data obtained for Style F in program directed settings are given in tables 47 through 51 and figures 12 through 16. A coefficient of 1.00 represents a "visibility threshold" for the CASES Styles. It is determined by the "critical percentage" assigned to each CASES Style (as given in Table 10, page 45). One goal set in EIP was to modify pupil behavior to reach Style E coefficients of 1.00 or higher in teacher-directed settings. Another was to reach the criterion of 1.00 for Style F in program directed settings.

Table 42

Cases Coefficients for Style E in Teacher Directed Settings
Means and Standard Deviations for Target Area A
for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient	
						Mn.	S.D.
011a	4	2	Nursery	S 67	4	1.16	.08
		3	Pre-K	S 68	5	.89	.23
		4	K	S 69	6	.80	.29
		5	1st (non EIP)	S 70	7	1.01	.35
011c	6	3	Pre-K	S 68	5	.66	.39
		4	K	S 69	6	1.01	.23
		5	1st (non EIP)	S 70	7	1.05	.17
011d	2	4	K	S 69	6	.99	.45
		5	1st (non EIP)	S 70	7	.99	.18
012a	12	2	Pre-K	S 67	5	.58	.42
		3	K	S 68	6	1.05	.11
		4	1st	S 69	7	.91	.22
		5	2nd	S 70	8	.99	.22
012b	1	4	1st	S 69	7	.78	.03
		5	2nd	S 70	8	.89	.24
012c	9	4	1st	S 69	7	.87	.21
		5	2nd	S 70	8	.97	.27
013a	7	4	Nursery	S 69	4	.79	.35
		5	Pre-K	S 70	5	.80	.30
212	24	4	1st	S 69	7	.97	.19
824	25	3	FT 1st	S 68	7	1.05	.13
825	25	3	FT 1st	S 68	7		
826	26	3	1st	S 68	7	1.02	.16
837	15	3	FT 1st	S 68	7		
838	15	3	FT 1st	S 68	7		
839	20	3	1st	S 68	7		

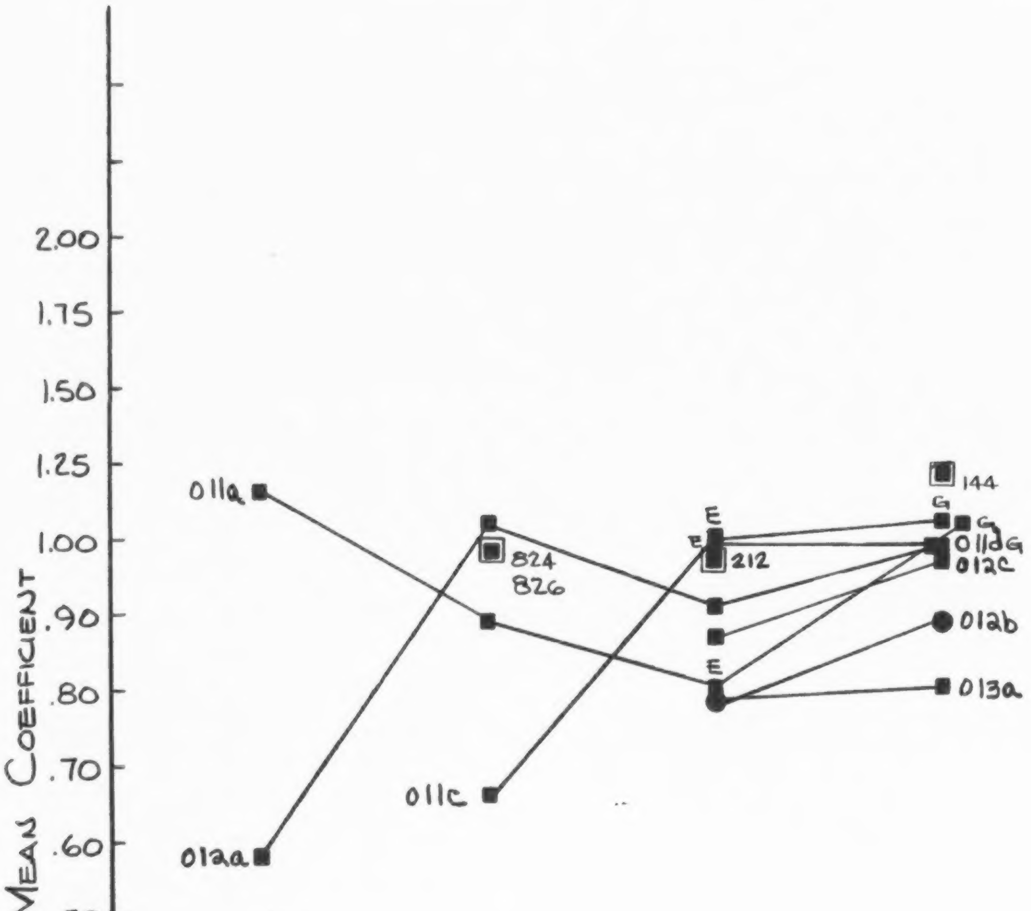

Fig. 7 Cases Style E coefficients in teacher directed settings for all experimental and control groups in Target Area A.

Table 43

Cases Coefficients for Style E in Teacher Directed Settings
Means and Standard Deviations for Target Area B
for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient Mn.	Coefficient S.D.
021a	10	2	Nursery	S 67	3	.98	.30
		3	Nursery	S 68	4	.68	.35
		4	Pre-K	S 69	5	.80	.39
		5	K	S 70	6	.64	.32
021b	3	3	Nursery	S 68	4	.73	.14
		4	Pre-K	S 69	5	.90	.53
		5	K	S 70	6	.59	.62
021c	3	4	Pre-K	S 69	5	.97	.26
		5	K	S 70	6	.81	.48
022a	7	2	K	S 67	6	.55	.30
		3	1st	S 68	7	1.01	.28
		4	2nd	S 69	8	.92	.32
		5	3rd	S 70		1.13	.16
022b	7	3	1st	S 68	7	1.02	.21
		4	2nd	S 69	8	.91	.33
		5	3rd	S 70	9	1.12	.12
141	18	5	4th	S 70	10	.92	.25
444	10	4	1st	S 69	7	.82	.05
		5	2nd	S 70	8	1.25	.00
544	14	4	1st	S 69	7	1.00	.10
811	2	3	FT 1st	S 68	7	1.15	.05
812	22	3	FT 1st	S 68	7	1.14	.10
813	30	3	1st	S 68	7	1.00	.17

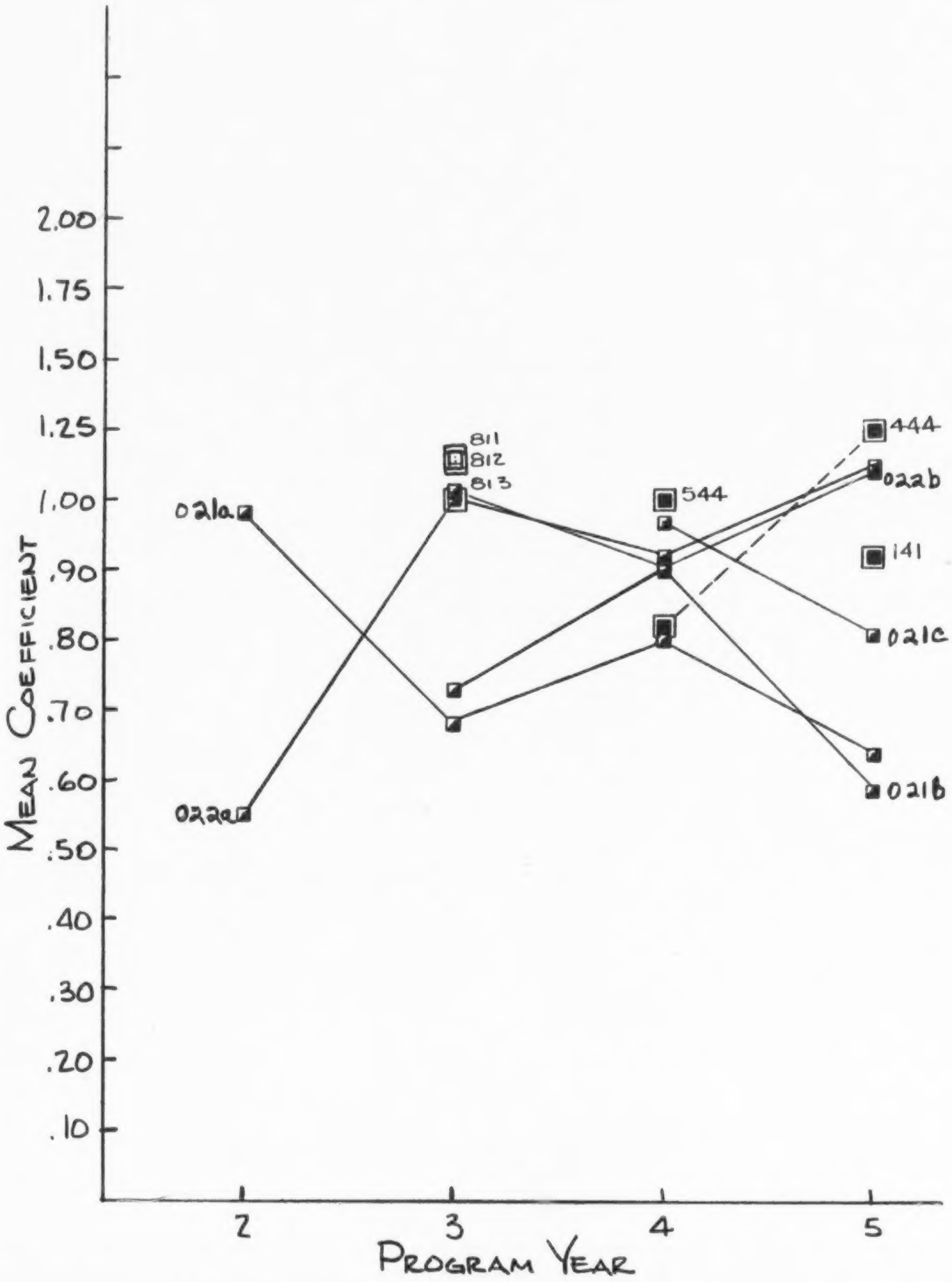

Fig. 8 Cases Style E coefficients in teacher directed settings for all experimental and control groups in Target Area B.

Table 44

Cases Coefficients for Style E in Teacher Directed Settings
Means and Standard Deviations for Target Area C
for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient Mn.	Coefficient S.D.
031a	17	2	1st	S 67	7	1.01	.20
		3	2nd	S 68	8	1.06	.20
		4	3rd	S 69	9	.95	.30
		5	4th (non EIP)	S 70	10	1.10	.23
031b	4	2	1st	S 67	7	1.02	.18
		3	2nd	S 68	8	.84	.47
		4	3rd	S 69	9	1.02	.23
031c	2	3	2nd	S 68	8	1.15	.08
		4	3rd	S 69	9	.88	.39
		5	4th (non EIP)	S 70	10	1.08	.26
031d	1	3	2nd	S 68	8	1.22	.06
		5	4th (non EIP)	S 70	10	1.02	.29
032a	12	2	Nursery	S 67	4	.75	.21
		3	Pre-K	S 68	5	1.05	.19
		4	K	S 69	6	.90	.22
		5	1st (non EIP)	S 70	7	1.05	.20
032b	3	4	K	S 69	6	.96	.31
		5	1st (non EIP)	S 70	7	1.15	.09
032c	2	4	K	S 69	6	1.01	.17
		5	1st (non EIP)	S 70	7	.94	.22
144*	22	5	EIP 2nd	S 70	8	1.20	.09
824	25	3	FT 1st	S 68	7	1.05	.13
825	25	3	FT 1st	S 68	7		
826	26	3	1st	S 68	7	1.02	.16
837	15	3	FT 1st	S 68	7		
838	15	3	FT 1st	S 68	7		
839	20	3	1st	S 68	7		

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* Control group 144 in Target Area C became part of a school wide EIP ungraded primary in the school year 1968-69. Children from EIP groups 032a, 032b, and 032c were mixed with 144 and taught by the same team of teachers using EIP experimental programs.

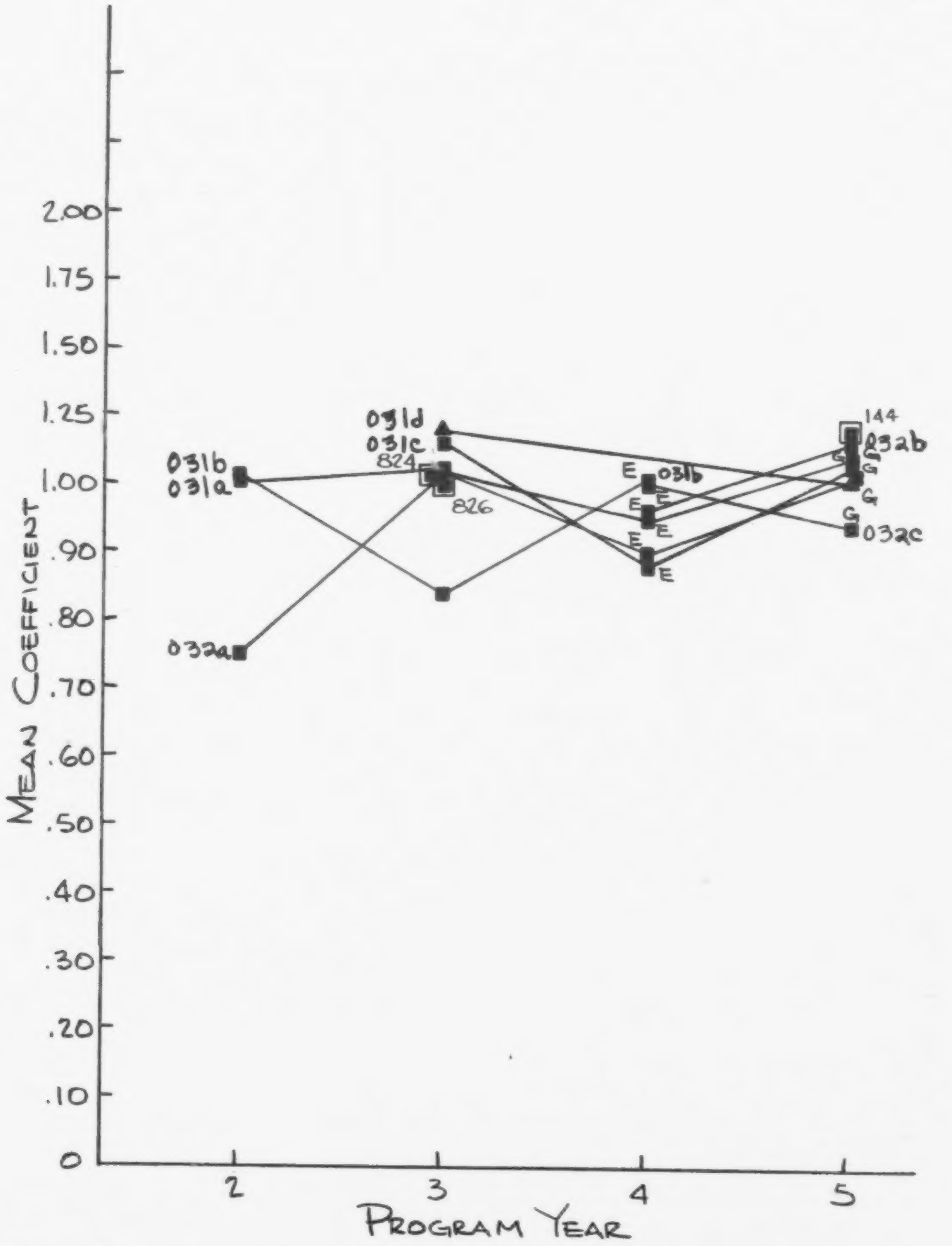

Fig. 9 Cases Style E coefficients in teacher directed settings for all experimental and control groups in Target Area C.

Table 45

Cases Coefficients for Style E in Teacher Directed Settings
Means and Standard Deviations for Target Area D for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient Mn.	Coefficient S.D.
041a	7	2	1st	S 67	7	.98	.26
		3	2nd	S 68	8	1.02	.30
		4	3rd	S 69	9	1.02	.24
		5	4th (non EIP)	S 70	10	1.02	.27
041b	7	2	1st	S 67	7	.90	.28
		3	2nd	S 68	8	1.13	.17
		4	3rd	S 69	9	.94	.35
		5	4th (non EIP)	S 70	10	1.06	.22
041c	3	3	2nd	S 68	8	1.08	.20
		4	3rd	S 69	9	.83	.39
		5	4th (non EIP)	S 70	10	1.10	.19
042a	5	2	K	S 67	6	.83	.32
		3	1st	S 68	7	.85	.28
		4	2nd	S 69	8	1.01	.21
		5	3rd	S 70	9	.93	.33
042b	10	3	1st	S 68	7	.86	.23
		4	2nd	S 69	8	.91	.27
		5	3rd	S 70	9	.90	.29
042c	1	5	3rd	S 70	9	.94	.25
044a	11	4	1st	S 69	7	.97	.22
		5	2nd	S 70	8	.95	.30
044b	2	4	1st	S 69	7	1.00	.17
		5	2nd	S 70	8	1.02	.22
141	18	5	4th	S 70	10	.92	.25
212	24	4	1st	S 69	7	.97	.19
244	22	4	1st	S 69	7	.68	.09
312	34	4	1st	S 69	7	.93	.15
444	10	4	1st	S 69	7	.82	.05
		5	2nd	S 70	8	1.25	.00
544	14	4	1st	S 69	7	1.00	.10
681	150 (7 classes)	5	4th	S 70	10		
811	23	3	FT 1st	S 68	7	1.15	.05
812	22	3	FT 1st	S 68	7	1.14	.10
813	30	3	1st	S 68	7	1.00	.17

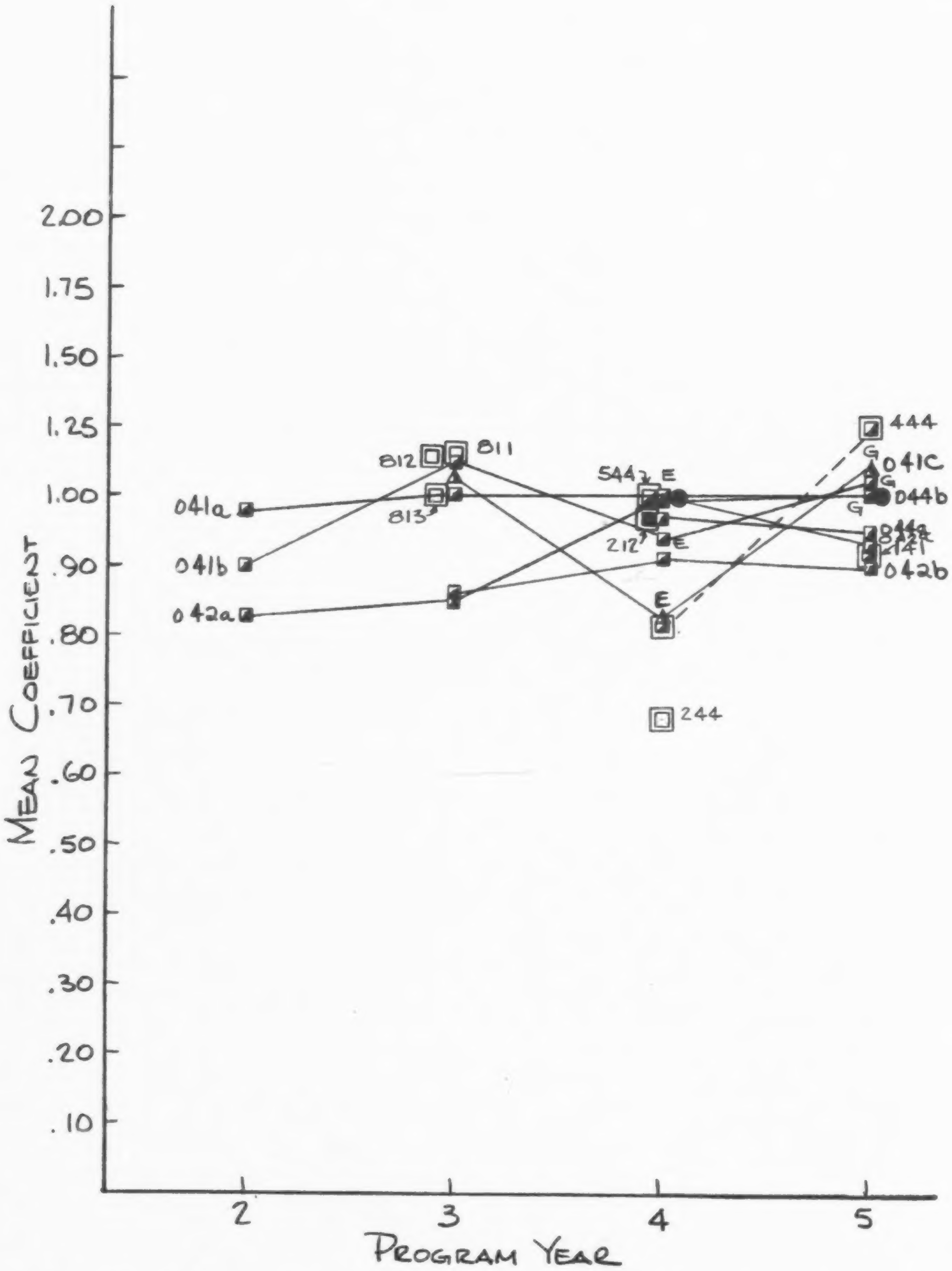

Fig. 10 Cases Style E coefficients in teacher directed settings for all experimental and control groups in Target Area D.

Table 46

Cases Coefficients for Style E in Teacher Directed Settings
Means and Standard Deviations for Infant Project Children
for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient Mn.	Coefficient S.D.
051a	7	3	Nursery	S 68	3	.90	.25
		4	Nursery	S 69	4	.83	.38
		5	Pre-K	S 70	5	.85	.20
051b	15	4	Nursery	S 69	3	.99	.28
		5	Nursery	S 70	4	.99	.14

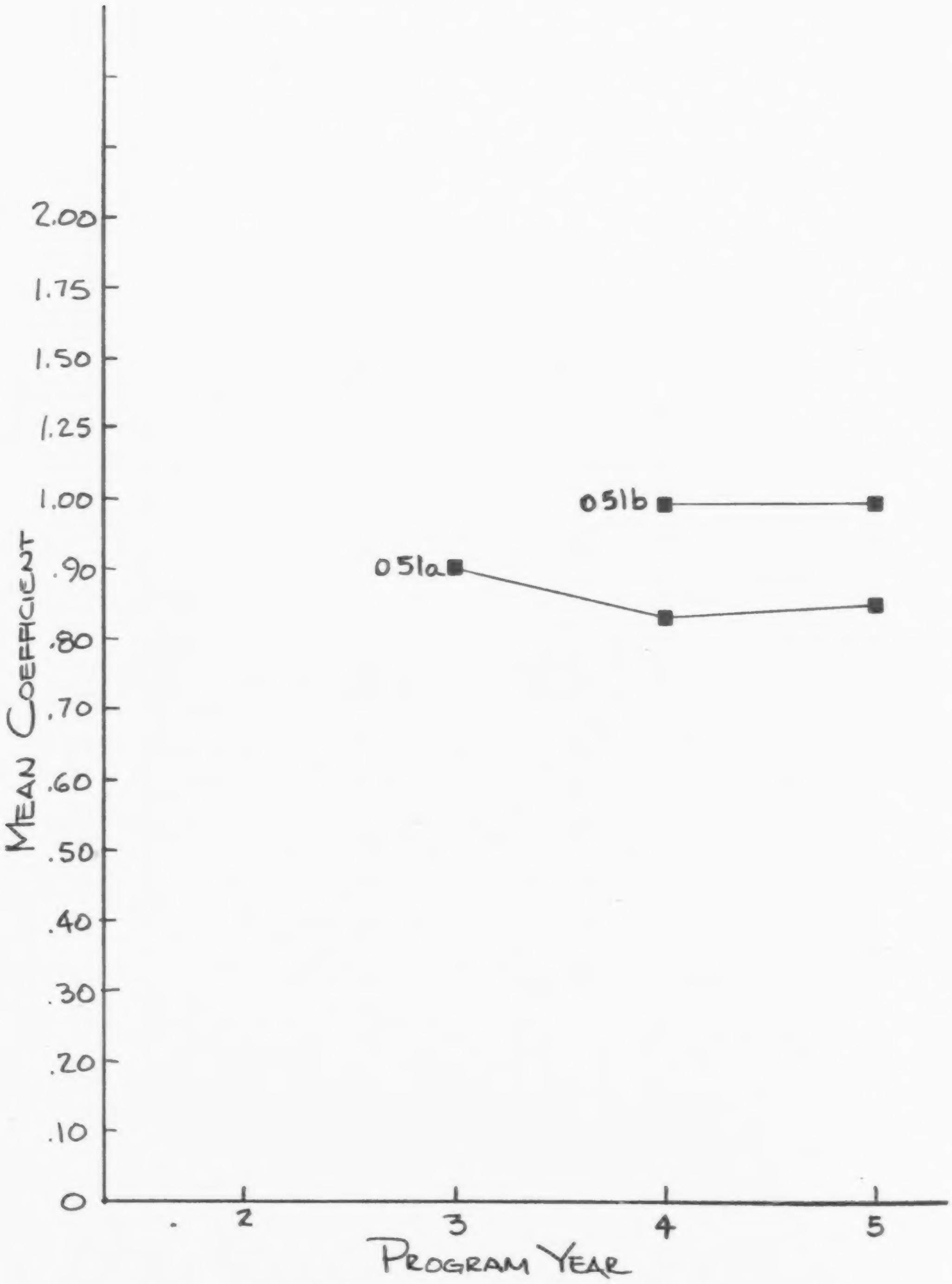

Fig. 11 Cases Style E coefficients in teacher directed settings for all experimental and control groups in the Infant Project.

Table 47

Cases Coefficients for Style F in Program Directed Settings Means and Standard Deviations for Target Area A for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient Mn.	Coefficient S.D.
011a	4	2	Nursery	S 67	4	.77	.46
		3	Pre-K	S 68	5	.68	.37
		4	K	S 69	6	1.11	.04
011c	6	3	Pre-K	S 68	5	.60	.45
		4	K	S 69	6	.97	.13
011d	2	4	K	S 69	6	.81	.15
012a	12	2	Pre-K	S 67	5	.88	.31
		3	K	S 68	6	.65	.30
		4	1st	S 69	7	.55	.39
		5	2nd	S 70	8	.67	.33
012c	9	4	1st	S 69	7	.57	.17
		5	2nd	S 70	8	.62	.33
013a	7	4	Nursery	S 69	4	.46	.37
		5	Pre-K	S 70	5	.83	.24
824	25	3	FT 1st	S 68	7	.66	.32
825	25	3	FT 1st	S 68	7		
826	26	3	1st	S 68	7	.59	.04
837	15	3	FT 1st	S 68	7		
838	15	3	FT 1st	S 68	7		
839	20	3	1st	S 68	7		

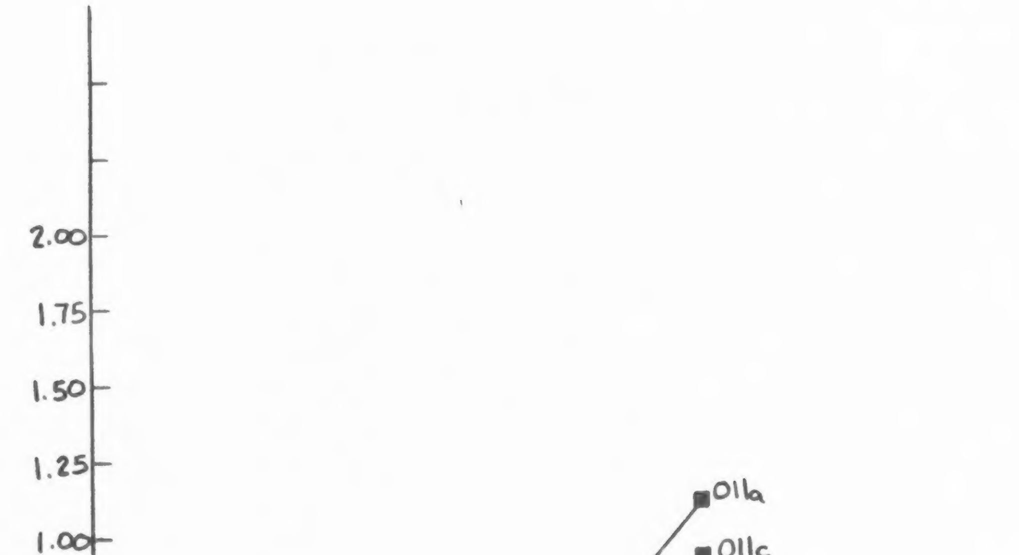

Fig. 12 Cases Style F in Program Directed Settings for all experimental and control groups in Target Area A.

Table 48

Cases Coefficients for Style F in Program Directed Settings Means and Standard Deviations for Target Area B for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient	
						Mn.	S.D.
021a	10	2	Nursery	S 67	3	.73	.49
		3	Nursery	S 68	4	.76	.36
		4	Pre-K	S 69	5	.62	.42
		5	K	S 70	6	1.06	.09
021b	3	3	Nursery	S 68	4	.63	.57
		4	Pre-K	S 69	5	.57	.44
021c	3	4	Pre-K	S 70	6	.67	.43
022a	7	2	K	S 67	6	.54	.37
		3	1st	S 68	7	.68	.41
		4	2nd	S 69	8	.76	.20
		5	3rd	S 70	9	1.04	.12
022b	7	3	1st	S 68	7	.65	.42
		4	2nd	S 69	8	.62	.33
		5	3rd	S 70	9	.93	.14
141	18	5	4th	S 70	10	.82	.14
811	23	3	FT 1st	S 68	7	.60	.08
812	22	3	FT 1st	S 68	7	.47	.12
813	30	3	1st	S 68	7	.45	.11

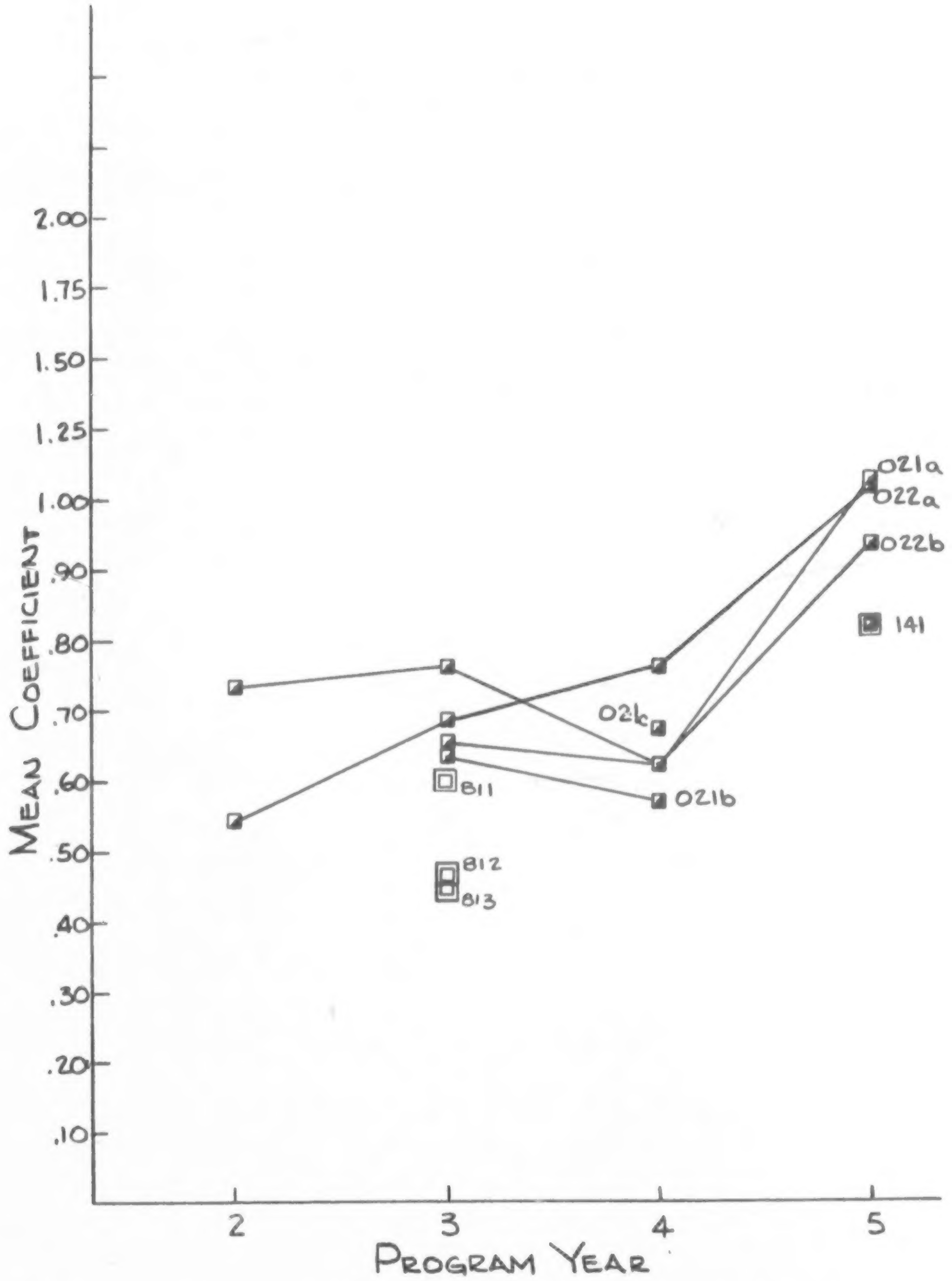

Fig. 13 Cases Style F in Program Directed Settings for all experimental and control groups in Target Area B.

Table 49

Cases Coefficients for Style F in Program Directed Settings
Means and Standard Deviations for Target Area C
for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient Mn.	Coefficient S.D.
031a	17	2	1st	S 67	7	.63	.44
		3	2nd	S 68	8	.76	.40
		4	3rd	S 69	9	.83	.36
031b	4	2	1st	S 67	7	.67	.45
		3	2nd	S 68	8	.90	.34
		4	3rd	S 69	9	.71	.46
031c	2	3	2nd	S 68	8	.79	.44
		4	3rd	S 69	9	.77	.37
031d	1	3	2nd	S 68	8	.76	.51
		4	3rd	S 69	9	.82	.40
032a	12	2	Nursery	S 67	4	.89	.27
		3	Pre-K	S 68	5	.62	.45
		4	K	S 69	6	.96	.19
032b	3	3	Pre-K	S 68	5	.75	.41
		4	K	S 69	6	.96	.20
144*	22	5	EIP 2nd	S 70	8	1.18	.00
824	25	3	FT 1st	S 68	7	.66	.32
825	25	3	FT 1st	S 68	7		
826	26	3	1st	S 68	7	.59	.04
837	15	3	FT 1st	S 68	7		
838	15	3	FT 1st	S 68	7		
839	20	3	1st	S 68	7		

* Control group 144 in Target Area C became part of a school wide EIP ungraded primary in the school year 1968-69. Children from EIP groups 032a, 032b, and 032c were mixed with 144 and taught by the same team of teachers using EIP experimental programs.

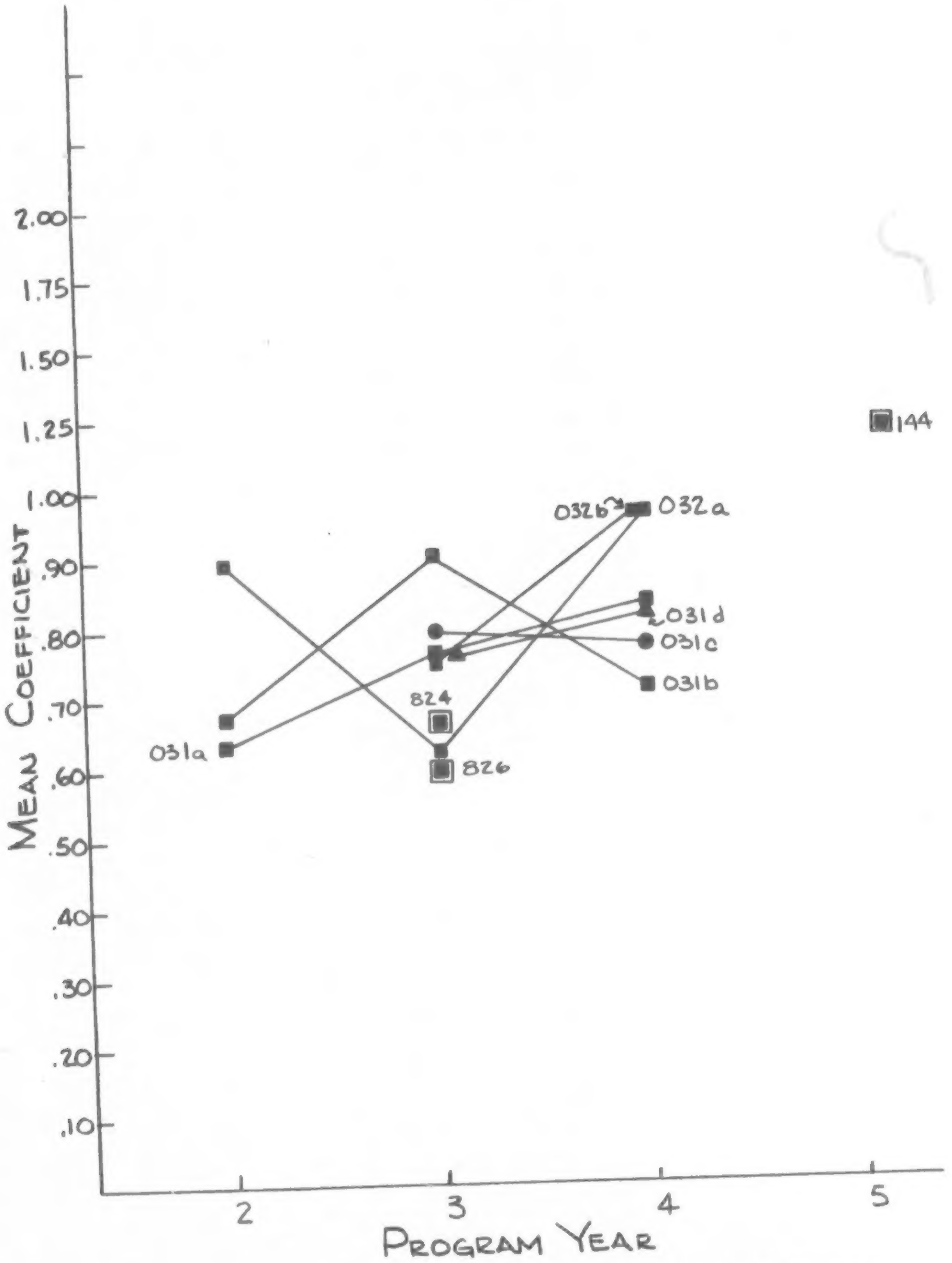

Fig. 14 Cases Style F in Program Directed Settings for all experimental and control groups in Target Area C.

Table 50

Cases Coefficients for Style F in Program Directed Settings
Means and Standard Deviations for Target Area D
for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient	
						Mn.	S.D.
041a	7	2	1st	S 67	7	.48	.30
		3	2nd	S 68	8	.76	.34
		4	3rd	S 69	9	.87	.25
041b	7	2	1st	S 67	7	.38	.27
		3	2nd	S 68	8	.81	.32
		4	3rd	S 69	9	.96	.24
041c	3	3	2nd	S 68	8	.84	.26
		4	3rd	S 69	9	.68	.26
042a	5	2	K	S 67	6	.58	.31
		3	1st	S 68	7	.80	.32
		4	2nd	S 69	8	.85	.31
		5	3rd	S 70	9	.90	.31
042b	10	3	1st	S 68	7	.70	.30
		4	2nd	S 69	8	.81	.25
		5	3rd	S 70	9	.70	.38
044a	11	2	Pre-K	S 67	5	.50	.38
		3	K	S 68	6	.59	.42
		4	1st	S 69	7	.85	.20
		5	2nd	S 70	8	.80	.37
044b	2	5	2nd	S 70	8	.79	.47
141	18	5	4th	S 70	10	.82	.14
811	23	3	FT 1st	S 68	7	.60	.08
812	22	3	FT 1st	S 68	7	.47	.12
813	30	3	1st	S 68	7	.45	.11
681	245	5	4th	S 70	10		

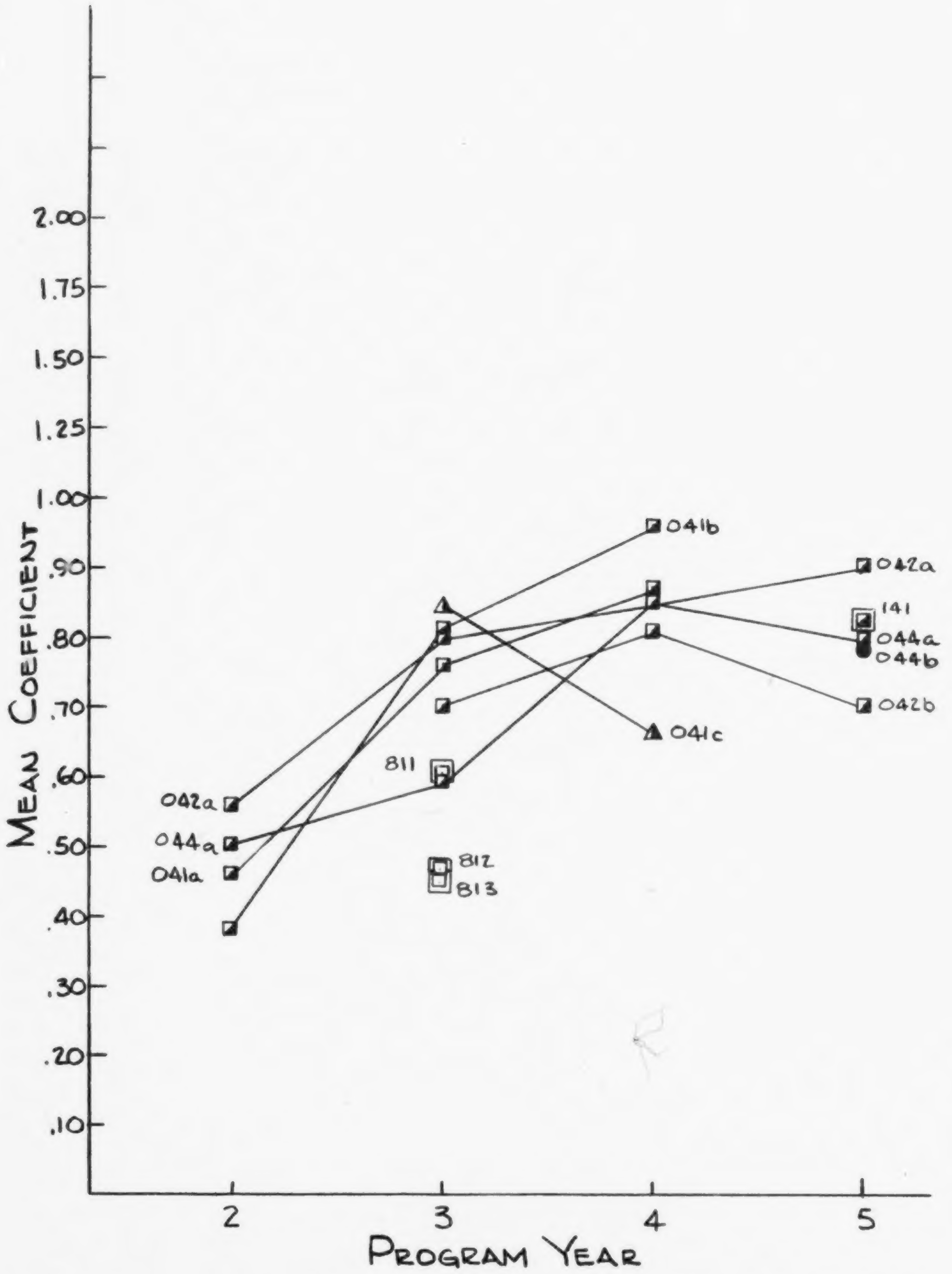

Fig. 15 Cases Style F in Program Directed Settings for all experimental and control groups in Target Area D.

Table 51

Cases Coefficients for Style F in Program Directed Settings
Means and Standard Deviations for Infant Project Children
for 1967 through 1970

Group	N	Project Year	Level	Date of Admin.	Mean C.A.	Coefficient Mn.	Coefficient S.D.
051a	7	3	Nursery	S 68	3	.86	.32
		4	Nursery	S 69	4	.65	.34
		5	Pre-K	S 70	5	.94	.15
051b	15	4	Nursery	S 69	3	.51	.39
		5	Nursery	S 70	4	1.04	.14
051c	5	3	Nursery	S 68	3	.76	.49

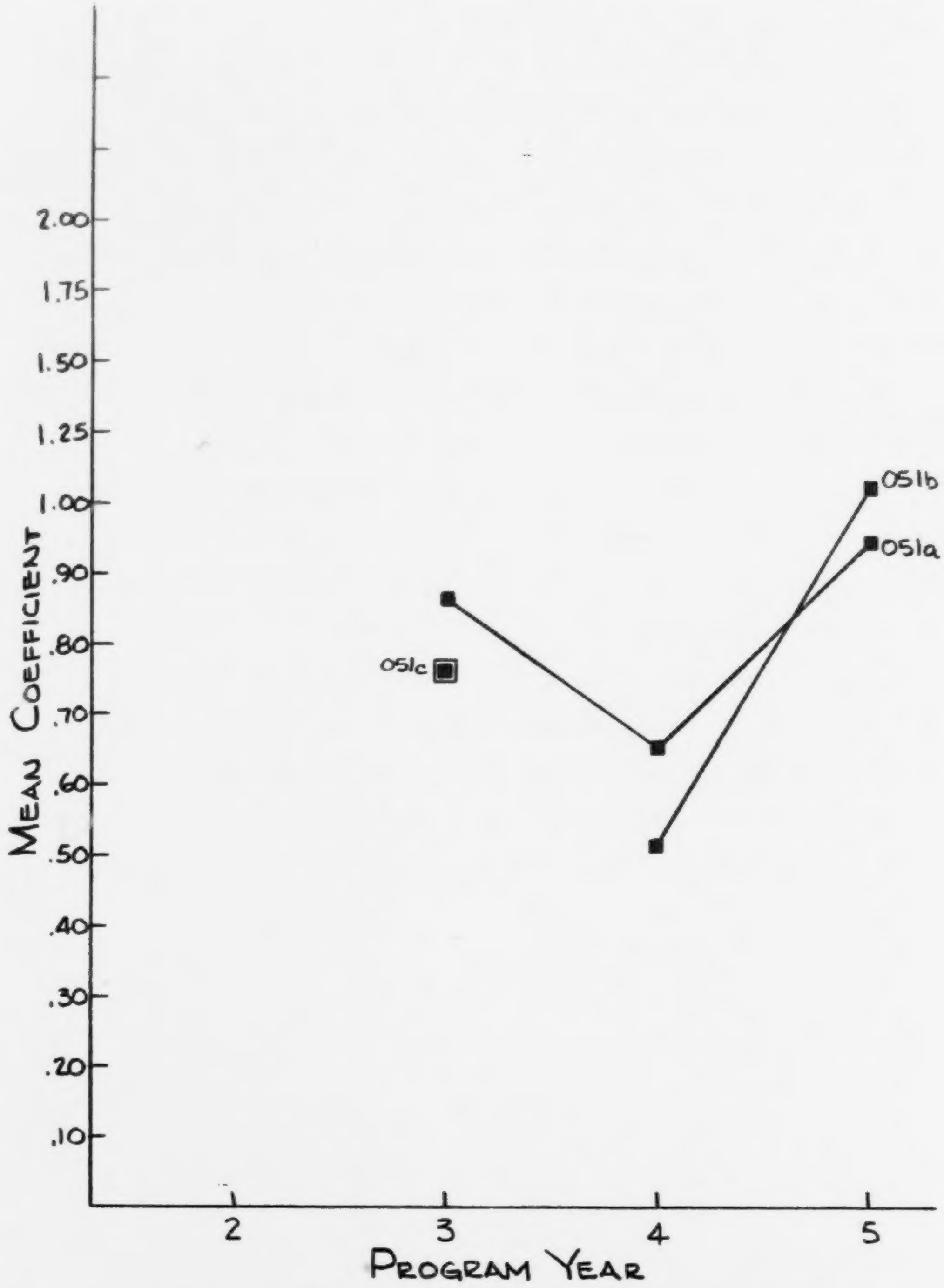

Fig. 16 Cases Style F in Program Directed Settings for all experimental and control groups in the Infant Project.

Discussion of CASES Results

It was hypothesized that EIP programs would tend to increase the obedient, conforming (Style E) behavior of pupils in teacher-directed settings. The concept of a "visibility threshold" was used to test this hypothesis. Table 10 (p.45) in Chapter Two presented "critical percentages" for each CASES Style. These critical percentages were obtained empirically by asking teachers to identify the predominant behavior characteristics of children in their classes (using the descriptive phrases in the left column of Table 10). The children thus identified were subsequently observed and percentages of behavior in each CASES Style in various school settings were computed.

This process produced "critical percentages" for each CASES Style which operated as "visibility thresholds." A pupil with a coefficient of 1.00 in any CASES Style reached the critical "visibility" percentage for that Style (in that particular setting).

A Chi-Square was computed using the Style E coefficients obtained in teacher-directed settings at the end of the first year in EIP (entry) and at the end of the last EIP academic year (exit). A two-by-two table was obtained by dichotomizing the CASES data (at 1.00) at entry and at exit. Table 52 presents the frequencies obtained in this analysis.

Table 52

Observed Frequencies of CASES Style E Behavior Coefficients in Teacher-directed Settings at Entry and Exit

Coefficients		At Exit		
		0.00 - 0.99	1.00 +	Total
At Entry	0.00 - 0.99	52	54	106
	1.00 +	26	22	48
	Total	78	76	154

Chi-Square = 9.80 $p < .001$

The data shown in Table 52 show that 54 EIP pupils changed from below criterion (1.00) to above during their participation in EIP program. Twenty-six subjects shifted from above 1.00 at entry to below at exit. The greater number were observed to shift in the predicted direction and such a change could be expected by chance less than once out of a hundred samples. The null hypothesis was rejected. The EIP program was found to lead to the predicted increases in Style E (obedient, conforming) behavior in teacher-directed settings.

The second, theoretically more important, hypothesis predicted higher Style F (independent, productive behavior) in non-teacher directed settings as a function of the EIP treatments. The data for Style F behavior in program-directed settings (the only non-teacher-directed settings commonly observed throughout the EIP and control classes) are given in the following two-by-two table (Table 53):

Table 53

Observed Frequencies of CASES Style F Behavior Coefficients in Program-directed Settings at Entry and Exit

Coefficients		At Exit		
		0.00 - 0.99	1.00 +	Total
At Entry	0.00 - 0.99	77	58	135
	1.00 +	11	4	15
	Total	88	62	150

Chi-Square + 32.014 $p < .001$

Fifty-eight EIP pupils changed from below 1.00 to 1.00 or above during their participation in the program. Eleven who were observed to have Style F coefficients above 1.00 at entry were found below that point at exit. The greater number changed in the predicted direction and the probability that chance alone would account for the observed change was less than once out of a thousand. The null hypothesis was again rejected and the EIP program was judged to have been effective in producing independently productive behavior in classroom settings where pupils were expected to work on tasks without direct teacher involvement or supervision.

Even though both research hypotheses were found supported, the question of comparisons with the control sample remained to be investigated. To determine whether the EIP program was more effective than programs in the public schools (including Follow Through), Chi Squares were computed using the observed frequencies (above and below criterion) for the EIP sample at exit and the control groups at the end of the first grade. Data for EIP pupils included children aged 3 through 9 years at exit. The controls averaged 8 years at the time of observation.

The data for Style E in teacher-directed settings and Style F in program-directed settings are presented in Tables 54 and 55.

Table 54

Observed Frequencies of CASES Style E behavior Coefficients in Teacher-directed Settings for EIP and Control Subjects

Group	Coefficients		
	0.00 - 0.99	1.00	Total
EIP	87	80	167
Control	117	122	239
Total	204	202	406

Chi-Square = 0.3881 $p < .70$ (non-significant)

The null hypothesis (of no difference) between the experimentals and controls was accepted. These results suggest that the experimental EIP programs and the public school programs were equally effective in promoting dependent, conforming and submissive behavior during those times when teachers asked for attention, cooperation, and compliance.

Table 55

Observed Frequencies of CASES Style F Behavior Coefficients in Program-directed Settings for EIP and Control Subjects

	Coefficients		
Group	0.00 - 0.99	1.00 +	Total
EIP	97	65	162
Control	134	1	135
Total	231	66	297

Chi-Square = 66.0785 $p < .001$

In the case of Style F behavior in program-directed settings, the null hypothesis (of no difference) was rejected. The EIP program was found significantly more effective in producing students who demonstrated independent-productive, assertive behavior in school settings in which programmed activities were presented to the pupils for their completion in the absence of direct supervision or instruction. Only one child in the control group reached criterion (1.00) while 65 experimental subjects reached it.

In another comparison, the control children were found to display significantly more dependent-submissive behavior in program-directed settings than the EIP pupils. The Chi-Square in this case was 75.5986.

Taken together these results support completely the research hypotheses. The experimental behavior modification programs and curricular offerings provided in EIP (and described in Chapter Two) were found effective in producing schools in which low-income, educationally retarded children were able to develop self-directed, productive, reliable, assertive behaviors in settings calling for such characteristics without the loss of obedience and

and conformity during instruction and other teacher-directed activities.

In subsequent studies relationships between Style coefficients and academic achievement in EIP will be investigated. A preliminary analysis of 40 children in the Laboratory School produced modest negative correlations (-.05 to -.35) between mid-year Style A, B, C, and D coefficients and spring MAT Reading scores. Correlations of the order of .20 were found for Style E and MAT Reading in both sexes. Style F coefficients were found to correlate .03 for boys and .86 for girls with MAT Reading. These findings are only preliminary (since all settings were pooled) but they suggest that independent, productive boys in this sample were less ready than girls to accept the academic goals of the school. They were, apparently, working on another, non-reading-oriented agenda. Further studies in which behavior Styles by settings are correlated with achievements test scores promise to be more productive in determining functional relationships.

Effects of EIP Treatments on Intellectual Development

Three standardized measures were used to assess intellectual development from entry to EIP at about age 2 through age 9 or 10 at the completion of the three-year ungraded program. The main instrument used was the Stanford-Binet Intelligence Scale (Form L-M, 1960 Revision). The Wechsler Preschool and Primary Scale of Intelligence was experimented with to determine if it would correlate with the Wechsler Intelligence Scale for Children as an alternative to the use of the Stanford-Binet. After a period of trial use, reliance on the WPPSI and the WISC was discontinued except in those cases where initial scores on the S-B at entry to EIP classes were not available. Tables 56 through 60 and Figures 17 through 21 present Stanford-Binet I.Q. scores and standard deviations for experimental and control groups by target area. For those years and terms where WPPSI and WISC data were available (and Stanford-Binets had not been administered) S-B mean I.Q.s were estimated by means of regression analysis using relationships between scores on the two tests in question for those subjects who had received both tests at the same chronological age.

Data on intellectual development obtained from the WISC (and to a lesser extent from the WPPSI) were apparently subject to practice effects. An item analysis of the responses of a sample of children who had been administered both the S-B and the WISC several times over a two- or three-year period suggested that the subjects were remembering questions from prior administrations of the WISC. The S-B appeared to be less subject to practice effects (due to the fact that items are changed in the pattern of S-B administration) and it became the preferred measure used in tracing intellectual development during EIP treatment periods.

Full Scale I.Q.s obtained using the WPPSI and WISC are presented in Tables 61 through 68 and Figures 22 through 29.

Several special studies of the relationships between WISC and WPPSI data obtained with EIP subjects were completed during the five-year period. Abstracts of these studies are given in Volume III, Chapter VII of the Final Report. Additional findings will be reported in subsequent journal articles.

Table 56

Stanford-Binet (Form L-M) Means and Standard Deviations for Target Area A for 1966 through 1970

				C.A.		I.Q.	
Group	Project Year	Date of Admin.	N	Mn.	S.D.	Mn.	S.D.
011a	1	S 66	4	38.8	3.4	91.5	8.2
	2	S 67	3	46.0	5.3	101.3	6.7
	3	F 67	4	54.3		92.4[a]	
		S 68	4	60.8		95.5[a]	
	4	F 68	4	65.8		95.8[a]	
		S 69	4	71.8	3.8	93.3	8.5
	5	S 70	4	84.8	4.6	93.8	11.7
011c	3	F 67	6	53.0		90.7[a]	
		S 68	6	58.2		88.2[a]	
	4	F 68	6	63.8		90.9[a]	
		S 69	6	69.8	4.3	87.3	8.0
	5	S 70	6	82.8	4.4	85.0	12.2
011d	4	F 68	2	72.0	0.0	100.0	4.2
	5	S 70	2	84.5	2.1	86.0	4.2
012a	2	S 67	12	59.5	3.7	94.3	15.1
	3	F 67	12	66.5		91.9[a]	
		S 68	12	72.9		89.2[a]	
	4	F 68	12	78.6	3.5	94.4	15.0
		S 69	12	83.3	3.8	97.6	17.0
	5	F 69	12	89.5	3.6	95.3	14.4
		S 70	12	95.2	3.9	95.5	12.6
012c	4	F 68	9	78.7	4.4	96.6	11.2
		S 69	9	83.1	4.3	95.7	11.5
	5	F 69	9	89.4	4.2	94.8	14.3
		S 70	9	95.0	4.5	102.1	11.7
013a	4	F 68	7	41.9	2.5	89.9	12.0
		S 69	7	47.7	2.4	96.6	10.3

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[a] Stanford-Binet I.Q. and M.A. estimated from WPPSI Verbal I.Q. scores at appropriate chronological ages, using the formula: SB = (.6459 x WPPSI Verbal) - (.2407 x CA) + constant of 52.01. The equation used was based on an analysis of 47 sets of WPPSI and S-B scores using WPPSI Verbal scores, WPPSI Performance scores, sex, race, and CA as predictors. After WPPSI Verbal and C.A. were employed none of the other variables contributed significant variance.

Table 56 (continued) - Stanford-Binet (Form L-M) Means and Standard Deviations for Target Area A for 1966 through 1970

Group	Project Year	Date of Admin.	N	C.A.		I.Q.	
				Mn.	S.D.	Mn.	S.D.
013a	5	F 69	7	53.7	2.6	94.0	9.5
		S 70	7	59.6	3.2	96.7	6.6
111	2	S 67	6	46.4	2.7	80.5	7.8
	5	S 70	5	86.8	3.3	83.6	7.1
112	2	S 67	8	58.3	3.8	73.9	9.4
	4	S 69	7	82.6	4.1	85.6	10.4
	5	S 70	8	95.8	3.5	82.1	12.3
121	2	S 67	4	36.2	4.7	101.0	8.5
	5	S 70	5	78.0	2.5	88.2	6.7
911	5	S 70	10	81.3	4.3	85.0	8.2
912	5	S 70	12	95.7	9.5	98.1	13.1

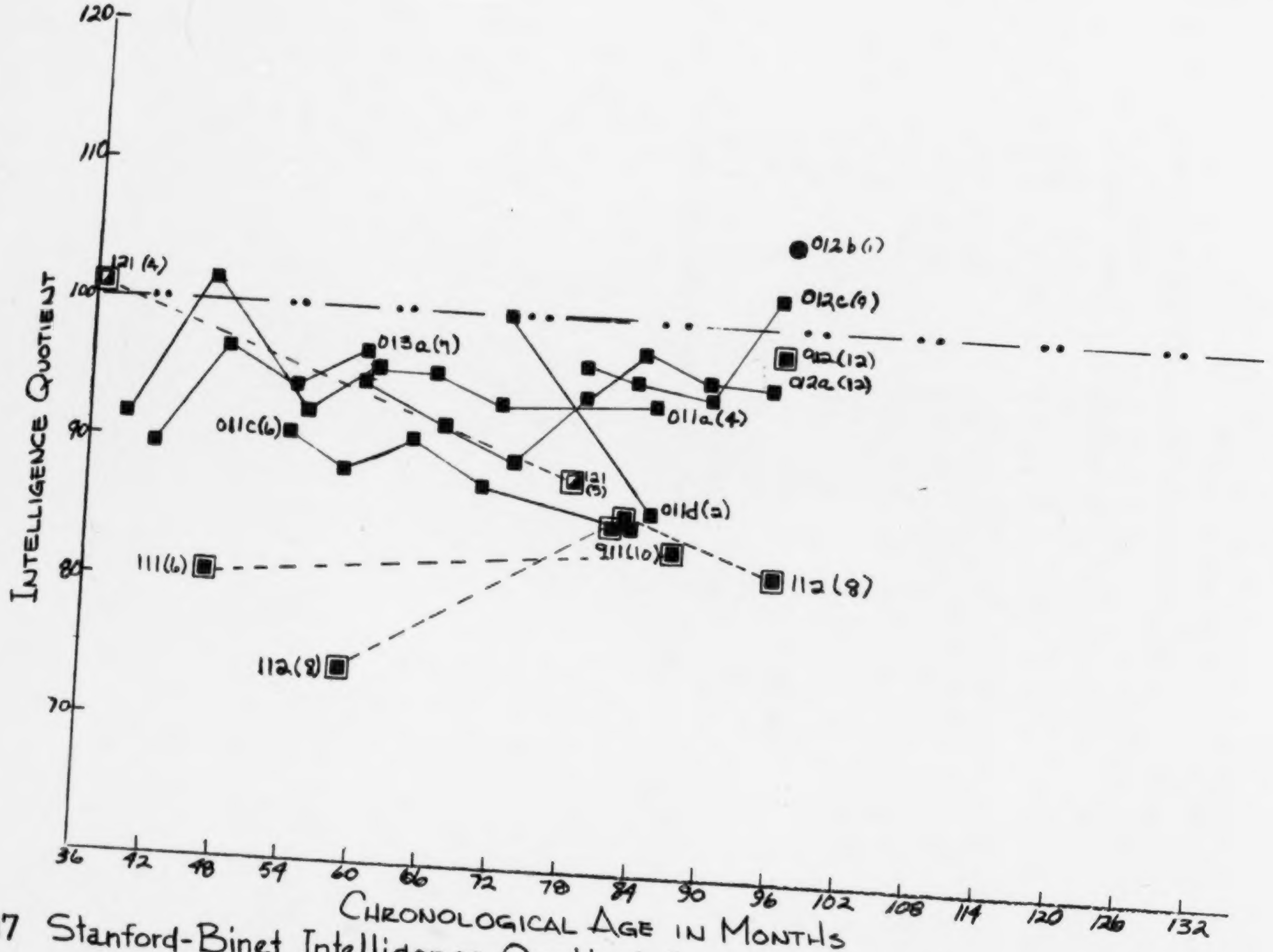

Fig. 17 Stanford-Binet Intelligence Quotient for all experimental and control groups in Target Area A.

Table 57

Stanford-Binet (Form L-M) Means and Standard Deviations
for Target Area B for 1966 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	I.Q. Mn.	I.Q. S.D.
021a	2	F 66	7	29.3	2.0	106.4	13.3
		S 67	10	35.8	5.3	97.5	13.9
	3	F 67	8	38.9	2.0	99.6	9.0
		S 68	8	45.3	1.8	109.5	9.3
	4	F 68	10	53.0		99.8[a]	
		S 69	10	59.8	5.2	99.0	10.0
	5	F 69	10	65.5	5.1	98.4	9.2
		S 70	10	70.6	4.9	102.6	13.1
021b	3	F 67	3	43.0	3.5	88.0	6.9
	4	F 68	3	53.0		95.9[a]	
		S 69	3	60.0	5.2	98.0	7.8
	5	F 69	3	65.7	4.6	90.0	5.3
		S 70	3	72.0	3.5	95.7	10.6
021c	4	F 68	3	55.0		89.0[a]	
		S 69	3	61.7	1.5	99.7	7.6
	5	F 69	3	67.0	2.0	89.0	12.5
		S 70	3	74.0	2.0	90.7	16.2
022a	2	S 67	7	71.1	2.9	88.1	7.8
	3	F 67	7	78.3		95.0[b]	
		S 68	2	81.5	2.1	95.5	17.7

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[a] Stanford-Binet I.Q. and M.A. estimated from WPPSI Verbal I.Q. scores at appropriate chronological ages, using the formula: SB = (.6459 x WPPSI Verbal) - (.2407 x CA) + constant of 52.01. The equation used was based on an analysis of 47 sets of WPPSI and S-B scores using WPPSI Verbal scores, WPPSI Performance scores, sex, race, and CA as predictors. After WPPSI Verbal and C.A. were employed none of the other variables contributed significant variance.

[b] Stanford-Binet I.Q. and M.A. estimated from WISC Verbal and Performance I.Q. scores at appropriate chronological ages, using the following formulas:
Black SB = (.5137 x WISC Verbal) + (.3038 x WISC Performance) + (4.9701) - (.2560 x CA) + 32.2413
White SB = (.5137 x WISC Verbal) + .3038 x WISC Performance) - (.2560 x CA) + 32.2413
Boys, Girls, All SB = (.5886 x WISC Verbal) + (.2417 x WISC Performance) - (.2373 x CA) + 33.0932
The equations used were based on analysis of 115 sets of WISC and S-B scores using WISC Verbal scores, WISC Performance scores, sex, race, and CA as predictors. After WISC Verbal, Performance, CA and race were employed, sex contributed no significant variance.

Table 57 (continued) - Stanford-Binet (Form L-M) Means and Standard Deviations for Target Area B for 1966 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	I.Q. Mn.	I.Q. S.D.
022a	4	F 68	7	90.4	2.6	90.1	10.0
		S 69	7	94.9	3.0	93.1	8.0
	5	F 69	7	101.1	2.9	93.6	9.0
		S 70	7	107.3	3.0	93.4	7.0
022b	3	S 68	7	82.8	5.0	81.5	7.3
	4	F 68	7	91.0	4.6	82.1	6.8
		S 69	7	94.6		80.9[b]	
	5	F 69	7	100.1		78.9[b]	
121	2	S 67	4	36.2	4.7	101.0	8.5
	5	S 70	5	78.0	2.5	88.2	6.7
122	2	S 67	5	71.2	5.2	81.4	13.8
	5	S 70	4	107.5	5.5	88.8	8.5
141	5	S 70	18	127.6	11.5	83.3	12.4
142	5	S 70	20	109.8	7.6	91.2	14.1
921	5	S 70	7	74.7	4.8	93.0	9.6
922	5	S 70	11	105.5	5.8	90.0	18.7

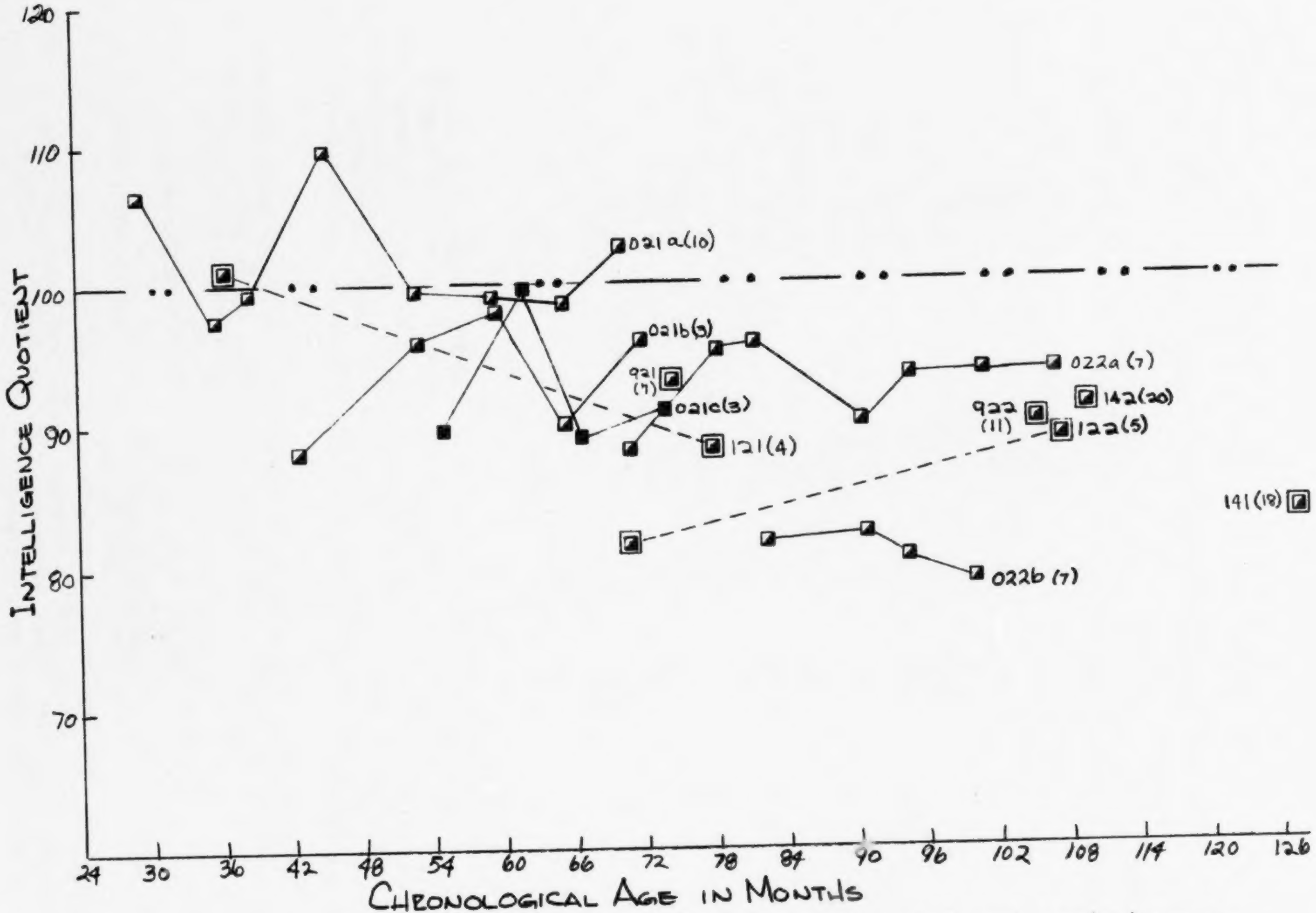

Fig. 18 Stanford-Binet Intelligence Quotient for all experimental and control groups in Target Area B.

Table 58

Stanford-Binet (Form L-M) Means and Standard Deviations for Target Area C for 1965 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	I.Q. Mn.	I.Q. S.D.
031a	1	F 65	17	66.6	3.5	90.4	11.4
		S 66	17	73.6	3.3	92.9	11.6
	2	F 66	17	79.1		94.8[b]	
		S 67	17	84.7		89.1[b]	
	3	F 67	17	89.2		95.4[b]	
		S 68	6	95.8	4.3	95.7	9.1
	4	F 68	17	101.3		91.7[b]	
		S 69	16	107.5	3.4	92.7	8.6
	5	S 70	16	120.5	3.7	97.8	8.9
031b	3	S 68	4	92.3	1.5	111.7	27.4
	4	F 68	4	97.8		99.5[b]	
		S 69	4	103.5		104.2[b]	
032a	2	S 67	12	47.2	2.9	99.6	11.6
	3	F 67	12	53.7		97.9[a]	
		S 68	12	59.4		97.7[a]	
	4	F 68	12	65.1		96.3[a]	
		S 69	12	71.2	3.1	98.4	12.4
	5	F 69	12	77.5	2.9	99.9	12.9
		S 70	12	83.5	3.7	103.8	11.4

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[a] Stanford-Binet I.Q. and M.A. estimated from WPPSI Verbal I.Q. scores at appropriate chronological ages, using the formula: SB = (.6459 x WPPSI Verbal) - (.2407 x CA) + constant of 52.01. The equation used was based on an analysis of 47 sets of WPPSI and S-B scores using WPPSI Verbal scores, WPPSI Performance scores, sex, race, and CA as predictors. After WPPSI Verbal and C.A. were employed none of the other variables contributed significant variance.

[b] Stanford-Binet I.Q. and M.A. estimated from WISC Verbal and Performance I.Q. scores at appropriate chronological ages, using the following formulas:
Black SB = (.5137 x WISC Verbal) + (.3038 x WISC Performance) + (4.9701) - (.2560 x CA) + 32.2413
White SB = (.5137 x WISC Verbal) + .3038 x WISC Performance) - (.2560 x CA) + 32.2413
Boys, Girls, All SB = (.5886 x WISC Verbal) + (.2417 x WISC Performance) - (.2373 x CA) + 33.0932
The equations used were based on analysis of 115 sets of WISC and S-B scores using WISC Verbal scores, WISC Performance scores, sex, race, and CA as predictors. After WISC Verbal, Performance, CA and race were employed, sex contributed no significant variance.

Table 58 (continued) - Stanford-Binet (Form L-M) Means and Standard Deviations for Target Area C for 1965 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	I.Q. Mn.	I.Q. S.D.
032b	4	S 69	3	69.7	4.2	106.7	5.7
	5	F 69	3	76.3	4.0	102.3	12.2
		S 70	3	82.7	4.5	102.7	11.4
032c	4	S 69	2	70.5	2.1	97.5	17.7
	5	F 69	2	76.5	2.1	99.5	21.9
		S 70	2	82.5	2.1	101.5	24.7
111	2	S 67	6	46.4	2.7	80.5	7.8
	5	S 70	5	86.8	3.3	83.6	7.1
112	2	S 67	8	58.3	3.8	73.9	9.4
	4	S 69	7	82.6	4.1	85.6	10.4
	5	S 70	8	95.8	3.5	82.1	12.3
931	5	S 70	15	114.4	8.3	86.1	9.6
932	5	S 70	11	82.8	6.2	86.4	9.1

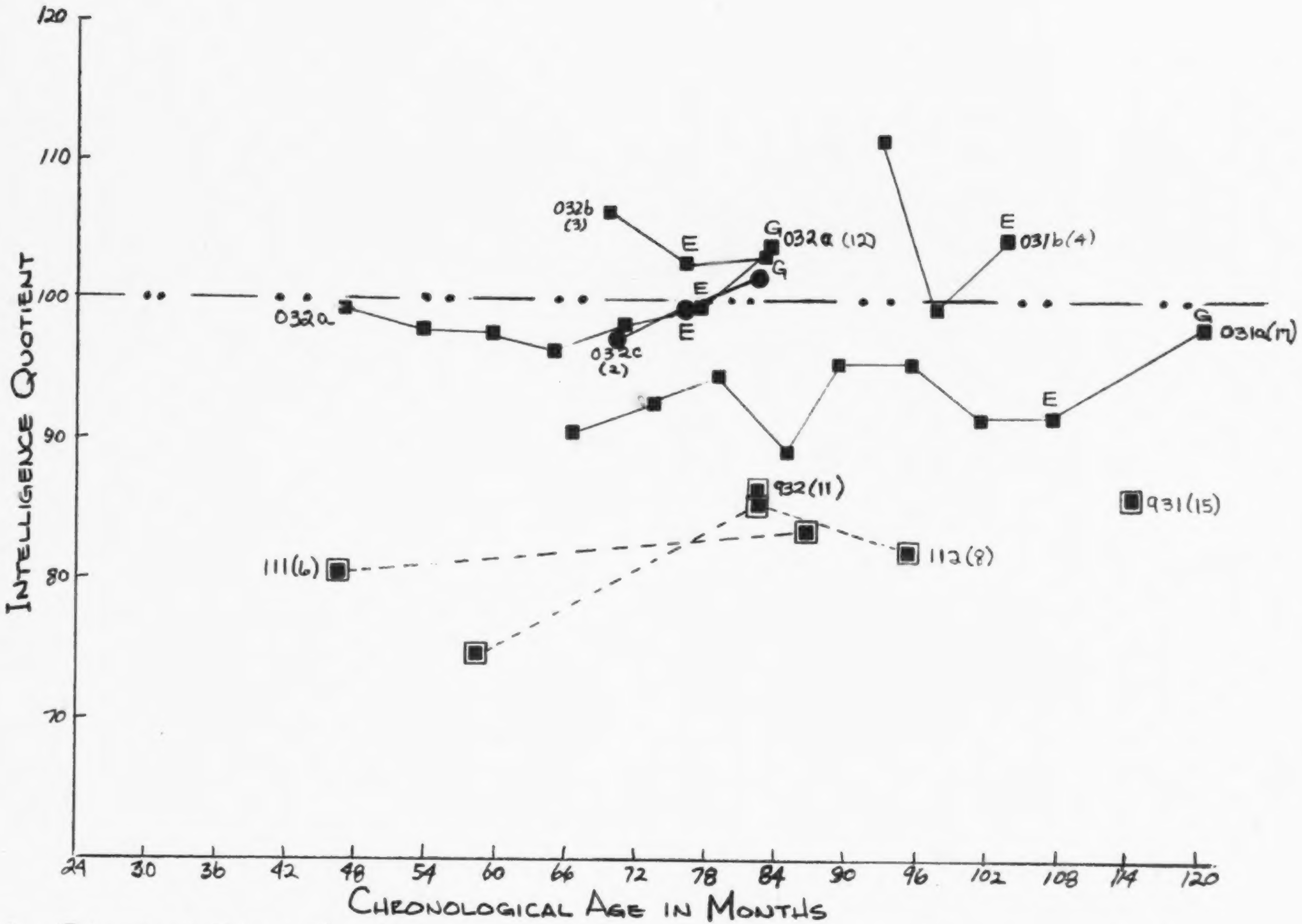

Fig. 19 Stanford-Binet Intelligence Quotient for all experimental and control groups in Target Area C.

Table 59

Stanford-Binet (Form L-M) Means and Standard Deviations
for Target Area D for 1965 through 1970

Group	Project Year	Date of Admin.	N	C.A.		I.Q.	
				Mn.	S.D.	Mn.	S.D.
041a	1	F 65	7	66.7	3.5	90.9	11.5
		S 66	7	73.0	3.8	94.3	9.0
	2	F 66	7	78.9		86.5[a]	
		S 67	7	84.7		95.6[a]	
	3	F 67	7	89.7		92.0[a]	
		S 68	7	95.4		91.0[a]	
	4	F 68	7	100.9		89.1[a]	
		S 69	7	106.7	3.7	90.1	11.2
	5	S 70	6	120.5	3.2	90.2	12.9
042a	2	S 67	4	71.3	3.5	92.3	16.9
	3	F 67	4	81.6		88.7[a]	
		S 68	4	86.8		92.6[a]	
	4	F 68	4	92.8		89.4[a]	
		S 69	4	95.3	3.5	85.0	11.8
	5	F 69	4	102.5	3.9	89.8	11.3
		S 70	4	107.0	3.9	89.0	13.2
044a	4	F 68	11	77.2	3.7	91.4	8.0
		S 69	11	82.2	3.7	90.7	7.9
	5	F 69	11	88.5	3.8	89.4	9.1
		S 70	11	95.1	3.8	90.1	10.5
044b	4	F 68	2	74.0	1.4	99.0	29.7
		S 69	2	78.5	2.1	112.0	32.5
	5	F 69	2	85.0	1.4	107.0	25.5
		S 70	2	90.5	2.1	106.5	27.6

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[a] Stanford-Binet I.Q. and M.A. estimated from WISC Verbal and Performance I.Q. scores at appropriate chronological ages, using the following formulas:
Black SB = (.5137 x WISC Verbal) + (.3038 x WISC Performance) + (4.9701) - (.2560 x CA) + 32.2413
White SB = (.5137 x WISC Verbal) + .3038 x WISC Performance) - (.2560 x CA) + 32.2413
Boys, Girls, All SB = (.5886 x WISC Verbal) + (.2417 x WISC Performance) - (.2373 x CA) + 33.0932
The equations used were based on analysis of 115 sets of WISC and S-B scores using WISC Verbal scores, WISC Performance scores, sex, race, and CA as predictors. After WISC Verbal, Performance, CA and race were employed, sex contributed no significant variance.

Table 59 (continued) - Stanford-Binet (Form L-M) Means and Standard Deviations for Target Area D for 1965 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	I.Q. Mn.	I.Q. S.D.
122	2	S 67	5	71.2	5.2	81.4	13.8
	5	S 70	4	107.5	5.4	88.8	8.5
141	5	S 70	18	127.6	11.5	83.3	12.4
142	5	S 70	20	109.8	7.6	91.2	14.1

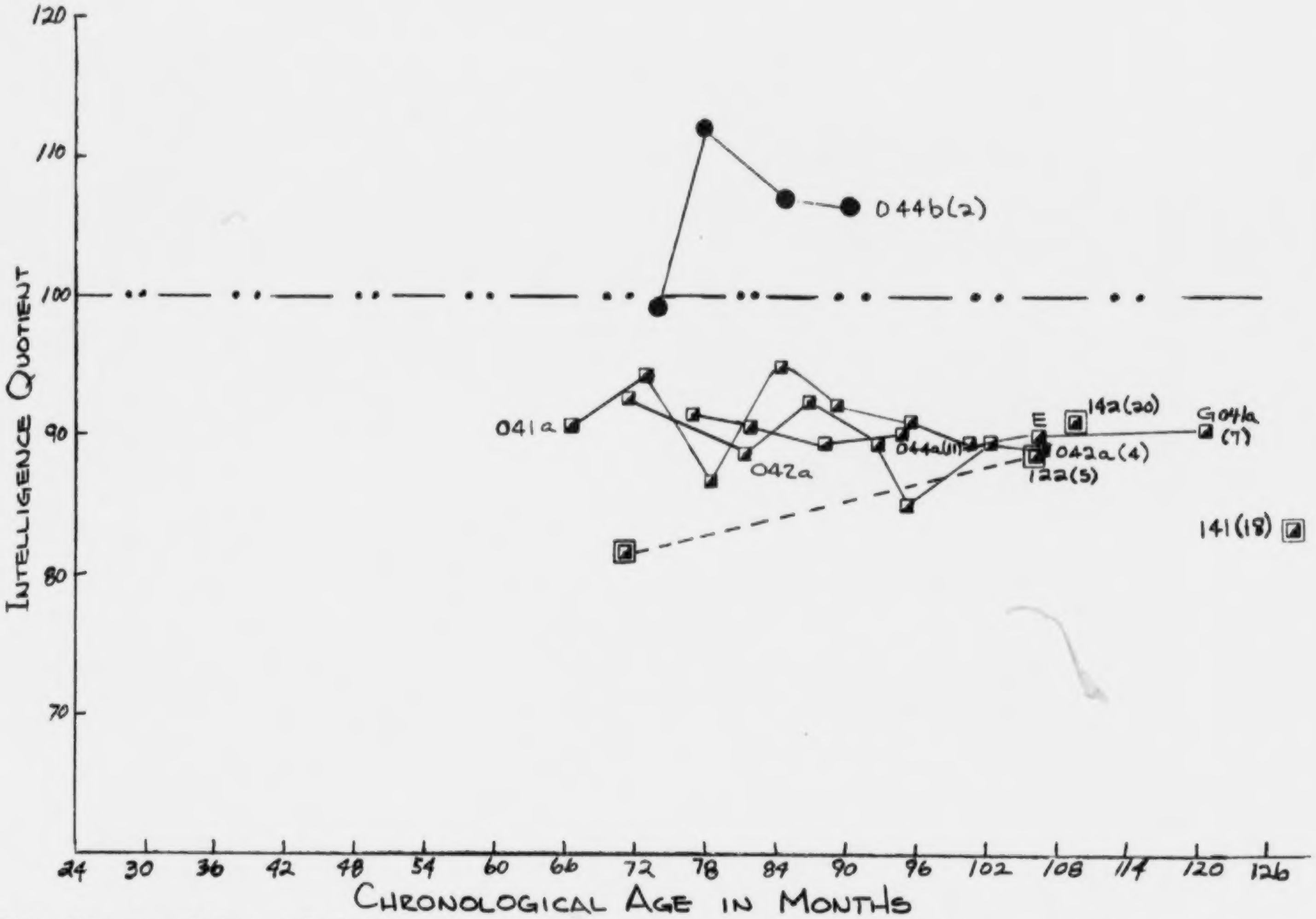

Fig. 20 Stanford-Binet Intelligence Quotient for all experimental and control groups in Target Area D.

Table 60

Stanford-Binet (Form L-M) Means and Standard Deviations for Infant Project Children for 1968 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	I.Q. Mn.	I.Q. S.D.
051a	3	S 68	7	33.0	1.2	97.6	10.0
	4	S 69	7	42.9	0.9	110.7	11.0
	5	S 70	7	54.0	1.0	108.6	13.9
051b	3	S 68	15	30.9	1.2	90.2	8.1
	4	S 69	15	42.1	1.2	99.1	12.6
	5	S 70	15	51.4	1.2	102.1	13.4
051c	3	S 68	4	33.2	0.3	88.5	7.8
	4	S 69	4	43.5	1.0	90.5	2.9
	5	S 70	5	55.8	1.1	87.4	9.7

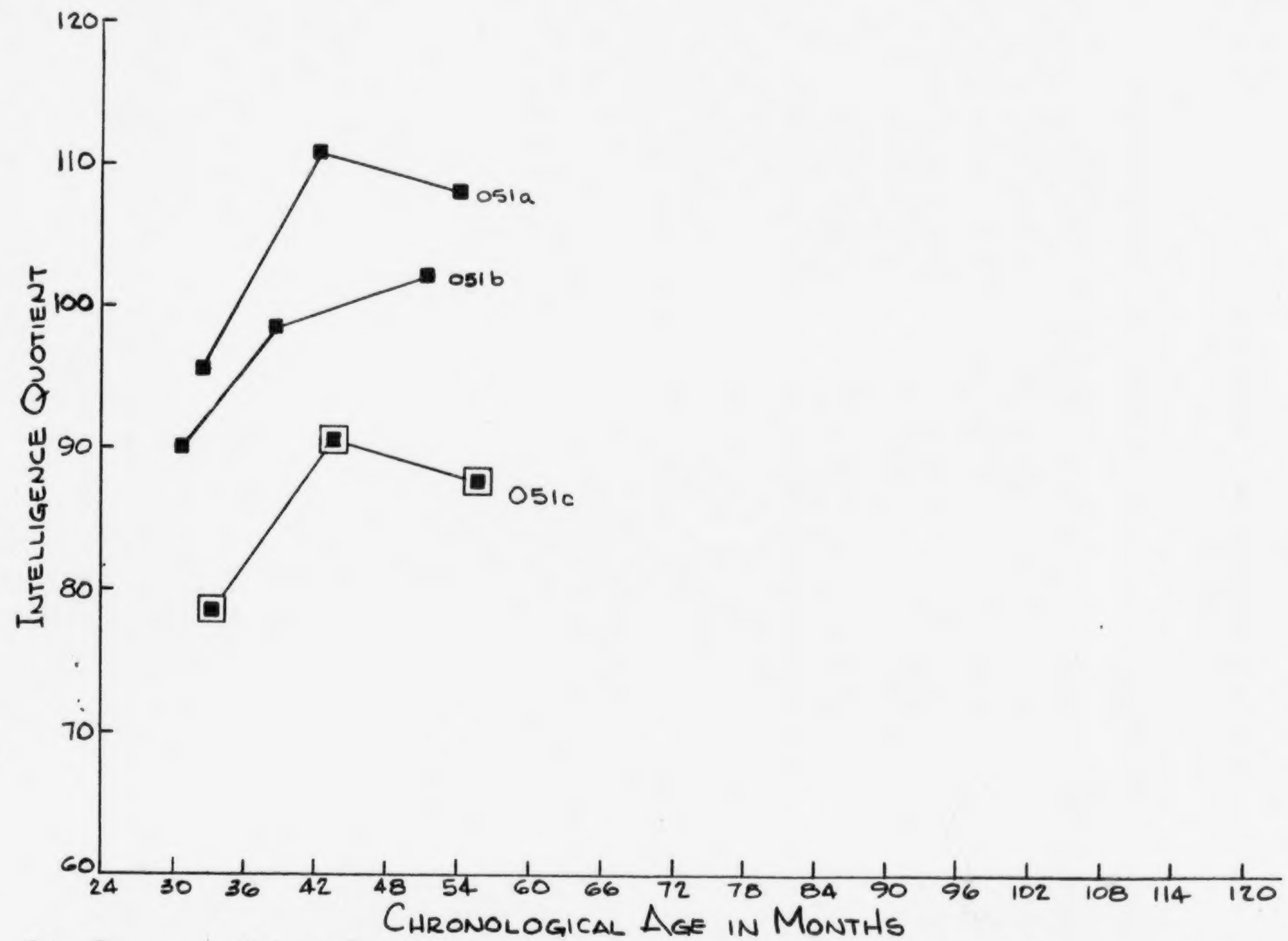

Fig. 21 Stanford-Binet Intelligence Quotient for all experimental and control groups in the Infant Project.

Table 61

Wechsler Intelligence Scale for Children
Means and Standard Deviations for Target Area A
for 1968 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	FIQ Mn.	FIQ S.D.
012a	4	F 68	12	77.2	3.9	91.8	11.0
012c	4	F 68	9	77.8	4.5	93.0	11.6
212	4	F 68	24	79.3	4.3	89.9	12.7
		S 69	23	84.4	4.3	93.5	12.1
	5	F 69	24	89.5	4.1	94.5	10.5
		S 70	24	95.3	4.1	96.5	13.6

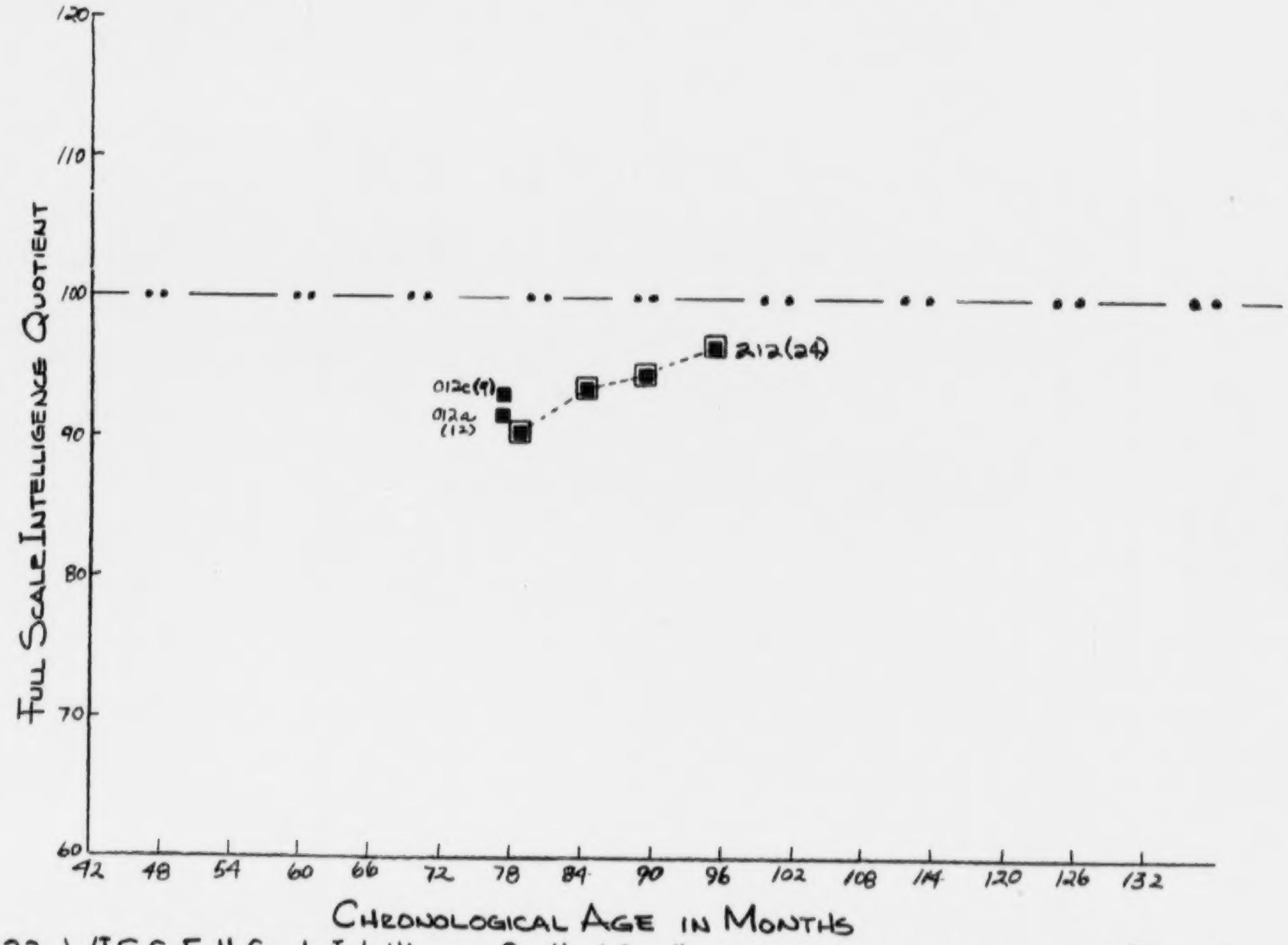

Fig. 22 WISC Full Scale Intelligence Quotient for all experimental and control groups in Target Area A.

Table 62

Wechsler Intelligence Scale for Children Means and Standard Deviations for Target Area B for 1967 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	FIQ Mn.	FIQ S.D.
022a	3	F 67	7	78.3	2.6	95.7	9.7
		S 68	6	82.7	2.5	96.0	8.8
	4	F 68	7	89.0	2.8	92.1	7.0
		S 69	7	94.9	2.7	98.4	6.3
	5	F 69	7	100.6	2.8	93.7	5.6
		S 70	7	106.7	2.9	100.3	6.8
022b	3	F 67	7	78.9	4.2	79.9	7.5
		S 68	7	83.4	4.5	85.3	7.3
	4	F 68	6	89.0	4.6	82.2	8.5
		S 69	7	94.6	4.4	84.0	6.7
	5	F 69	7	100.1	4.8	81.7	8.1
		S 70	7	106.4	4.5	83.7	9.9
444	4	F 68	10	78.5	4.6	83.1	14.6
		S 69	10	83.1	4.7	87.4	10.1
	5	F 69	10	89.5	4.6	90.7	10.8
		S 70	10	95.6	4.9	92.2	13.0
544	4	F 68	14	76.8	3.4	86.7	10.8
		S 69	14	81.6	3.5	93.5	13.4
	5	F 69	14	88.4	3.5	92.9	12.8
		S 70	14	94.4	3.2	95.3	12.3

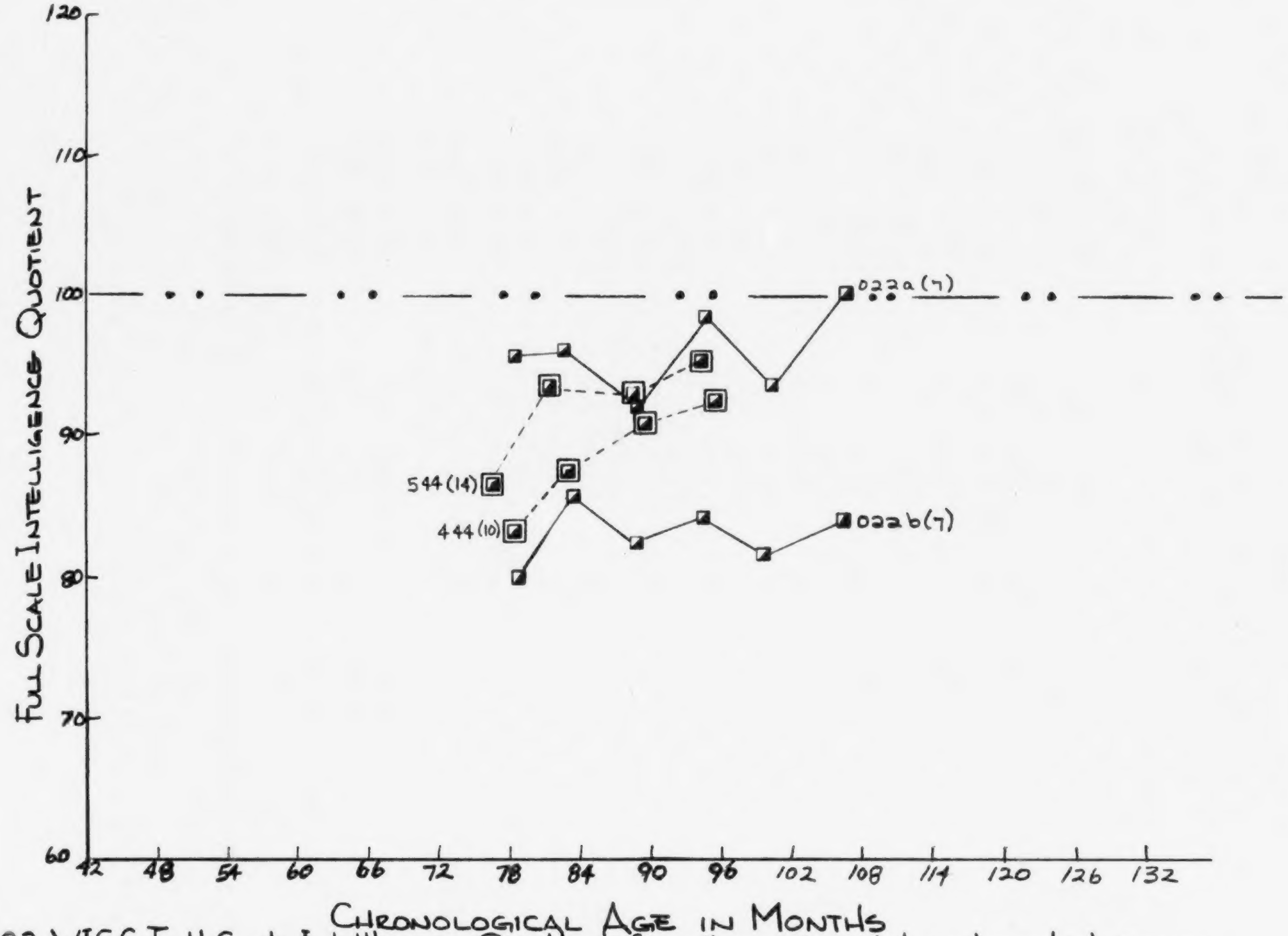

Fig. 23 WISC Full Scale Intelligence Quotient for all experimental and control groups in Target Area B.

Table 63

Wechsler Intelligence Scale for Children
Means and Standard Deviations for Target Area C
for 1966 through 1970

Group	Project Year	Date of Admin.	N	C.A.		FIQ	
				Mn.	S.D.	Mn.	S.D.
031a	2	F 66	17	79.2	3.4	93.3	11.9
		S 67	17	84.7	3.2	98.8	13.4
	3	F 67	16	89.3	3.6	98.9	10.3
		S 68	16	96.2	3.5	102.2	13.8
	4	F 68	17	101.4	3.4	98.1	11.6
		S 69	17	107.0	3.4	104.8	14.7
	5	S 70	17	119.9	3.6	102.2	11.7
031b	2	F 66	4	75.5	1.3	98.5	16.3
		S 67	4	81.5	1.3	110.8	14.8
	3	F 67	4	85.5	1.3	110.5	17.6
		S 68	4	92.5	1.3	113.5	22.6
	4	F 68	4	97.8	1.3	110.0	22.6
		S 69	4	103.5	1.3	118.5	19.5
	5	S 70	4	116.8	1.7	119.0	23.2
031c	3	F 67	2	80.0	0.0	101.5	9.2
		S 68	2	87.0	0.0	103.0	17.0
	4	F 68	2	92.5	0.7	106.0	19.8
		S 69	2	98.0	0.0	108.0	18.4
	5	S 70	2	111.0	0.0	101.5	20.5
131	2	S 67	12	81.5	5.2	87.0	10.4
	4	S 69	9	106.9	5.7	88.7	7.3
	5	S 70	12	120.1	4.8	92.2	12.3
312	4	F 68	34	78.3	3.6	92.3	12.4
		S 69	34	83.4	3.6	93.2	13.1
	5	F 69	33	89.0	3.6	95.0	13.5
		S 70	33	95.3	3.8	96.8	12.5

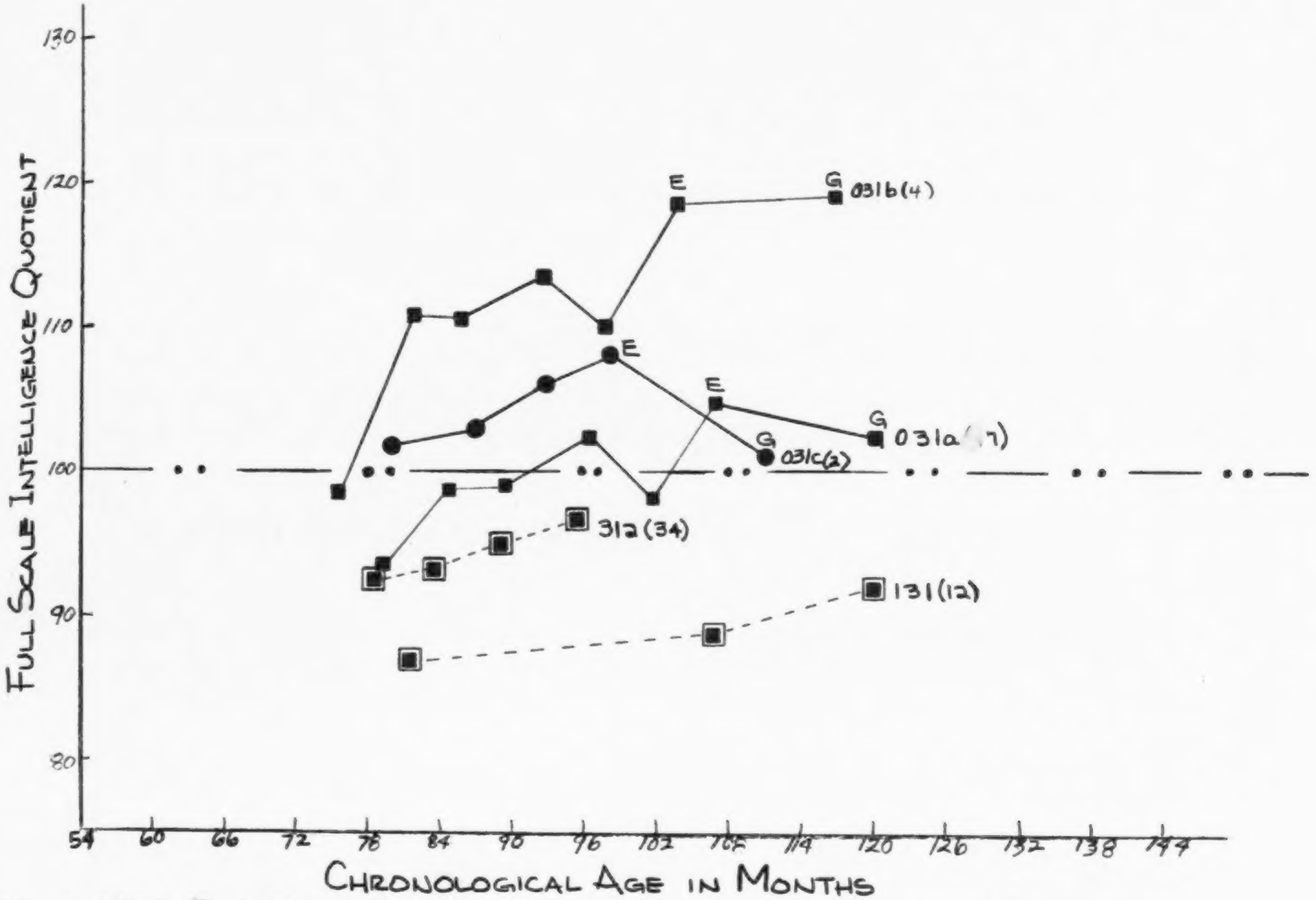

Fig. 24 WISC Full Scale Intelligence Quotient for all experimental control groups in Target Area C.

Table 64

Wechsler Intelligence Scale for Children
Means and Standard Deviations for Target Area D
for 1966 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	FIQ Mn.	FIQ S.D.
041a	2	F 66	7	78.9	3.6	92.6	15.5
		S 67	7	84.7	3.7	100.3	11.5
	3	F 67	6	89.7	3.2	97.7	12.6
		S 68	7	95.4	3.9	98.1	14.9
	4	F 68	7	100.9	3.6	97.1	12.8
		S 69	7	106.3	3.9	99.7	12.5
	5	S 70	7	119.1	4.1	96.9	12.7
041b	2	F 66	7	80.1	3.0	100.3	17.2
		S 67	7	85.6	3.0	105.7	18.6
	3	F 67	7	89.6	3.0	103.1	16.3
		S 68	7	96.0	3.2	107.0	17.5
	4	F 68	7	101.6	3.0	103.9	20.7
		S 69	7	107.4	3.3	103.1	19.5
	5	S 70	7	122.4	5.7	109.7	22.3
041c	3	F 67	3	98.7	13.9	77.3	3.5
		S 68	3	105.3	13.3	77.7	9.2
	4	F 68	3	110.7	13.9	85.7	5.8
		S 69	3	116.3	13.3	83.7	6.7
	5	S 70	3	129.3	12.3	81.7	2.5
042a	3	F 67	5	81.6	7.5	90.4	9.9
		S 68	5	86.8	8.5	97.2	4.6
	4	F 68	5	92.8	8.1	95.4	8.1
		S 69	5	98.2	8.5	94.2	7.9
	5	F 69	5	104.8	8.1	95.2	6.3
		S 70	5	110.6	8.2	97.4	9.7
042b	3	F 67	10	78.5	6.0	90.1	13.8
		S 68	10	83.2	6.1	90.4	14.3
	4	F 68	10	89.2	6.1	93.5	11.8
		S 69	10	94.6	5.9	93.0	13.4
	5	F 69	10	100.9	6.1	91.7	10.5
		S 70	10	106.9	5.9	91.8	13.1
044a	4	F 68	11	75.4	3.6	92.8	8.8

Table 64 (continued) - Wechsler Intelligence Scale for Children
Means and Standard Deviations for Target Area D for 1966 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	FIQ Mn.	FIQ S.D.
212	4	F 68	24	79.3	4.3	89.9	12.7
		S 69	23	84.3	4.3	93.5	12.1
	5	F 69	24	89.5	4.1	94.5	10.5
		S 70	24	95.3	4.1	96.5	13.6
244	4	F 68	22	77.4	3.5	98.1	13.6
		S 69	21	82.7	3.6	104.9	12.4
	5	F 69	22	87.6	3.6	103.3	12.5
		S 70	22	94.1	3.9	105.7	13.9
312	4	F 68	34	78.3	3.6	92.3	12.4
		S 69	34	83.4	3.5	93.2	13.1
	5	F 69	33	89.0	3.6	95.0	13.5
		S 70	33	95.3	3.8	96.8	12.5
444	4	F 68	10	78.5	4.6	83.1	14.6
		S 69	10	83.1	4.7	87.4	10.1
	5	F 69	10	89.5	4.6	90.7	10.8
		S 70	10	95.6	4.9	92.2	13.0
544	4	F 68	14	76.8	3.4	86.7	10.8
		S 69	14	81.6	3.5	93.5	13.4
	5	F 69	14	88.4	3.5	92.9	12.8
		S 70	14	94.4	3.2	95.3	12.3

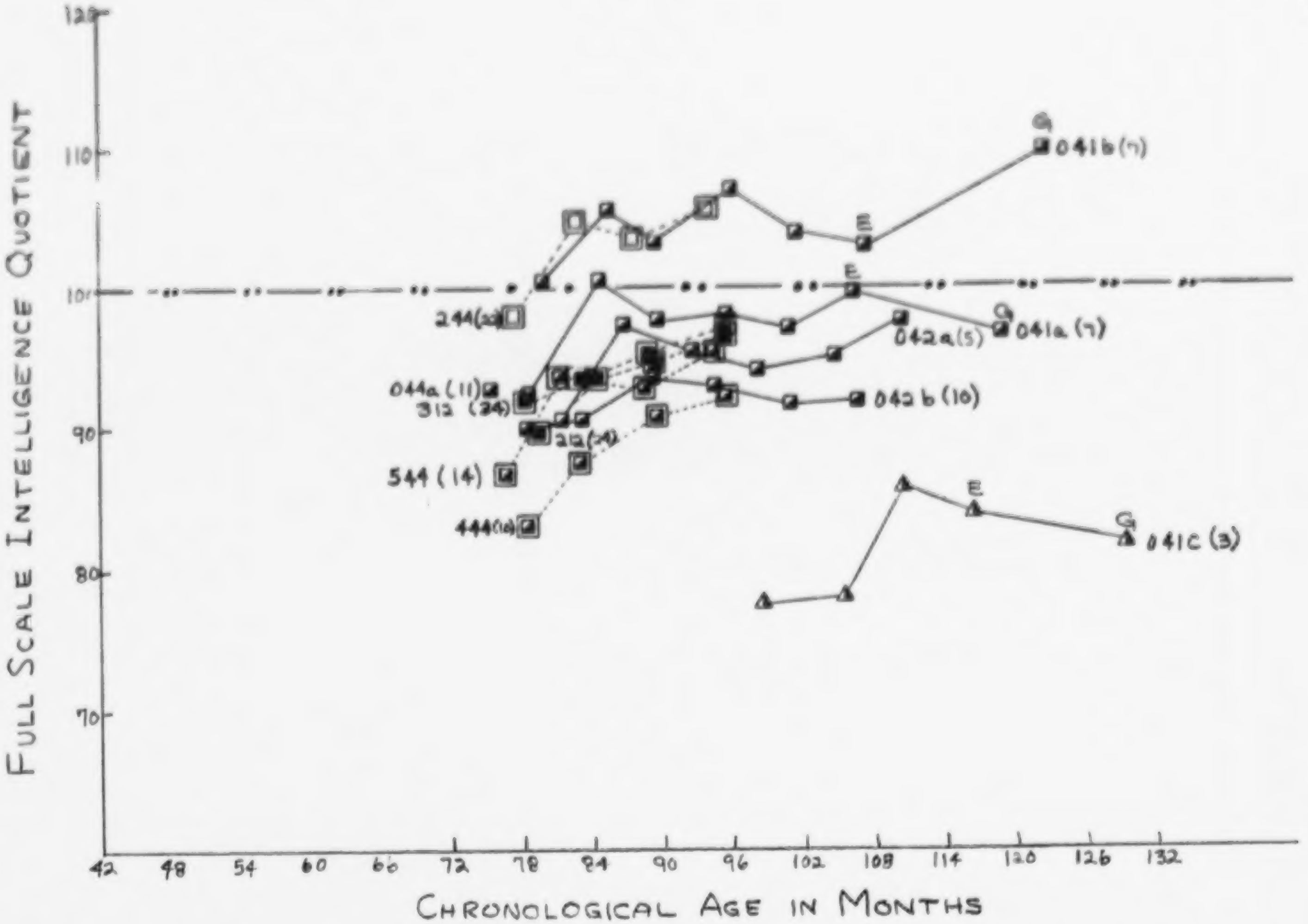

Fig. 25 WISC Full Scale Intelligence Quotients for all experimental and control groups in Target Area D

Table 65

Wechsler Preschool and Primary Scale of Intelligence
Means and Standard Deviations for Target Area A
for 1967 through 1970

Group	Project Year	Date of Admin.	N	C.A.		FIQ	
				Mn.	S.D.	Mn.	S.D.
011a	3	F 67	4	54.3	3.9	82.3	10.7
		S 68	4	60.8	3.4	84.8	7.9
	4	F 68	4	65.8	3.4	88.5	9.7
011c	3	F 67	6	52.8	4.3	79.0	9.1
		S 68	6	58.2	4.0	76.5	11.0
	4	F 68	6	63.8	4.3	83.0	9.0
011d	4	F 68	2	65.5	0.7	75.0	5.7
012a	3	F 67	12	66.5	3.4	82.5	12.4
		S 68	11	72.9	3.6	83.1	11.5

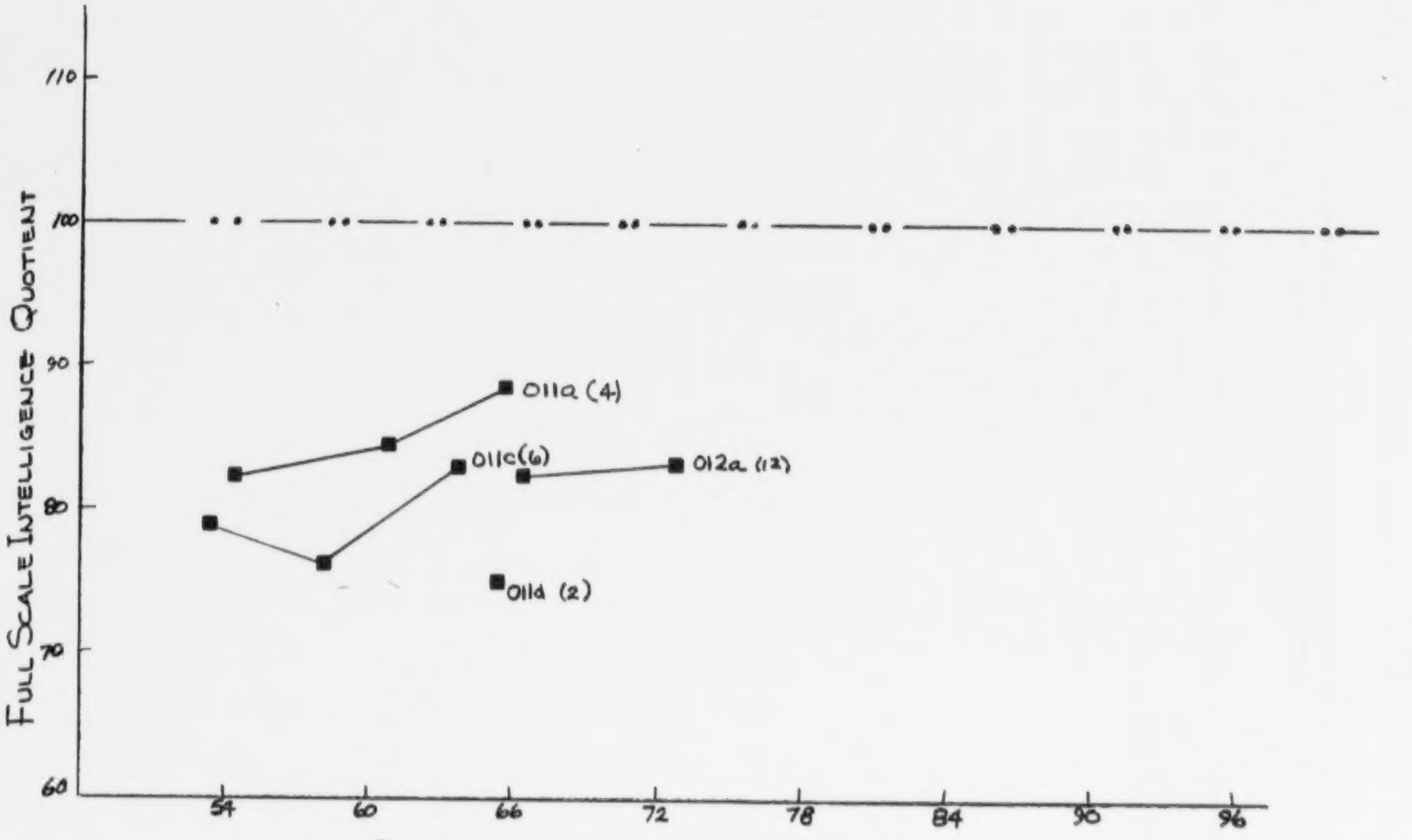

Fig. 26 WPPSI Full Scale Intelligence Quotient for all experimental and control groups in Target Area A.

Table 66

Wechsler Preschool and Primary Scale of Intelligence Means and Standard Deviations for Target Area B for 1967 through 1970

Group	Project Year	Date of Admin.	N	C.A.		FIQ	
				Mn.	S.D.	Mn.	S.D.
021a	4	F 68	10	53.0	5.1	90.6	12.7
		S 69	10	59.2	5.3	92.6	10.5
021b	4	F 68	3	53.0	5.2	84.0	8.7
		S 69	3	59.0	5.2	83.3	7.8
021c	4	F 68	3	55.0	1.7	79.0	8.7
		S 69	3	61.0	1.0	83.3	7.8
022a	3	F 67	5	76.2	2.3	81.4	6.1
	4	S 69	7	94.9	2.7	98.4	6.3
022b	3	F 67	5	75.8	2.3	72.2	8.9
		S 68	2	79.0	0.0	71.5	3.5
	4	S 69	7	94.6	4.4	84.0	6.7

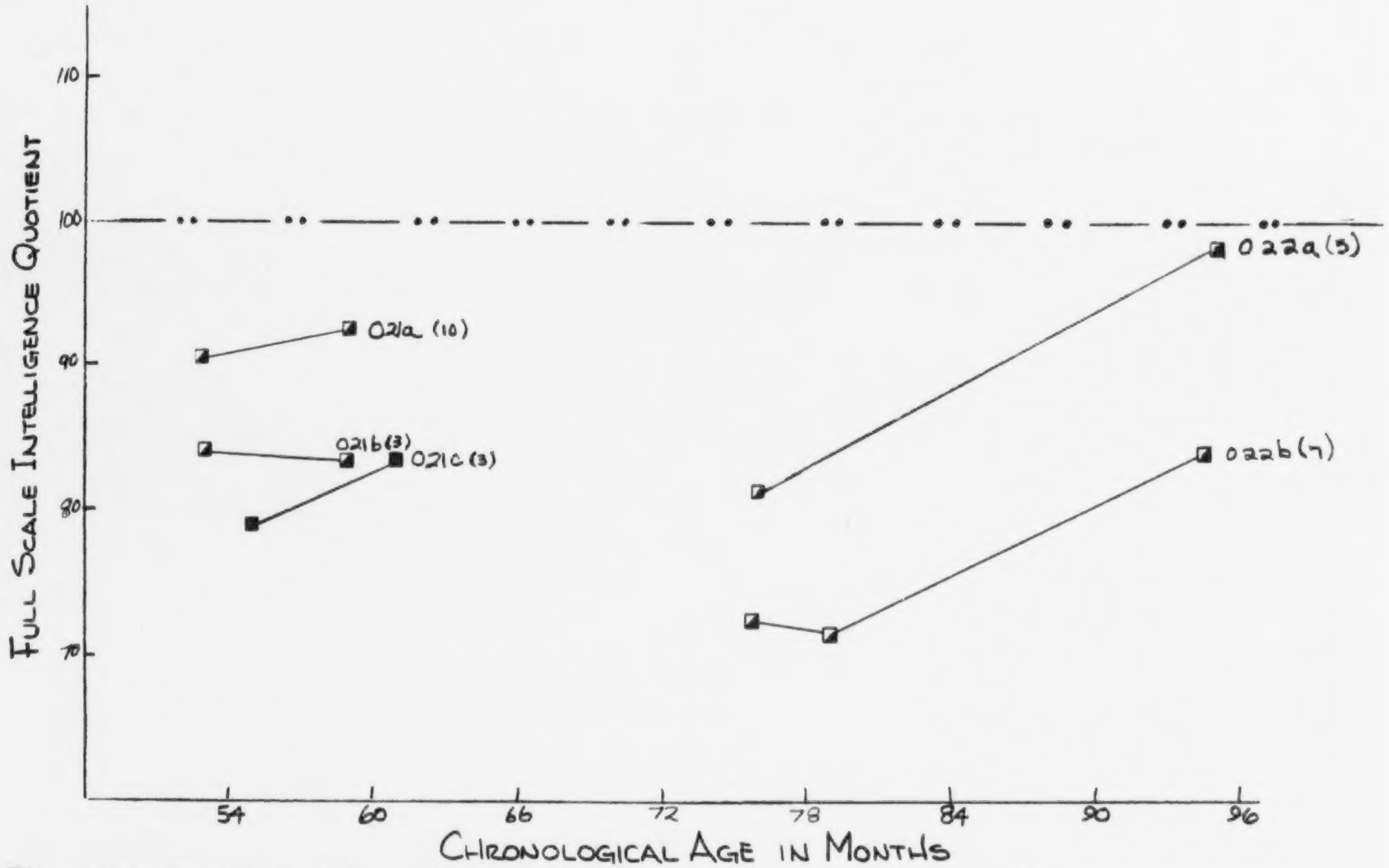

Fig.27 WPPSI Full Scale Intelligence Quotient for all experimental and control groups in Target Area B.

Table 67

Wechsler Preschool and Primary Scale of Intelligence
Means and Standard Deviations for Target Area C
for 1967 through 1970

				C.A.		FIQ	
Group	Project Year	Date of Admin.	N	Mn.	S.D.	Mn.	S.D.
032a	3	F 67	12	53.6	3.1	87.8	9.8
		S 68	12	59.4	3.1	92.2	11.0
	4	F 68	12	65.1	3.3	90.8	12.7
032b	3	F 67	3	53.0	3.6	90.0	7.9
		S 68	3	58.3	4.0	92.3	7.6
	4	F 68	3	63.7	3.5	98.7	5.5
032c	4	F 68	2	64.5	2.1	82.5	9.2

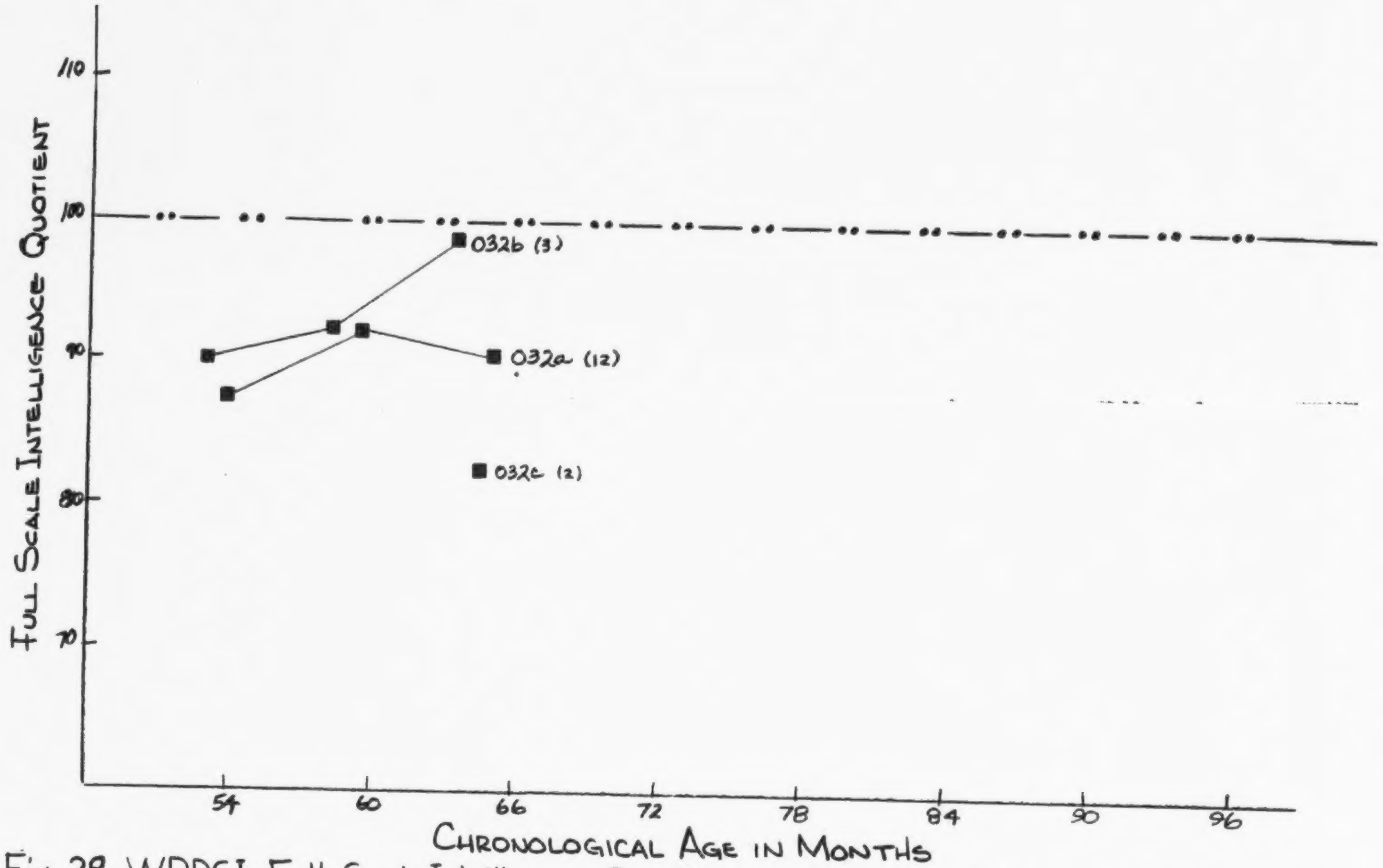

Fig. 28 WPPSI Full Scale Intelligence Quotient for all experimental and control groups in Target Area C.

Table 68

Wechsler Preschool and Primary Scale of Intelligence
Means and Standard Deviations for Target Area D
for 1967 through 1970

Group	Project Year	Date of Admin.	N	C.A.		FIQ	
				Mn.	S.D.	Mn.	S.D.
042a	3	F 67	3	76.3	3.1	84.0	12.5
042b	3	F 67	8	75.0	3.1	76.4	17.6
044a	4	F 68	10	75.3	3.2	87.2	11.2

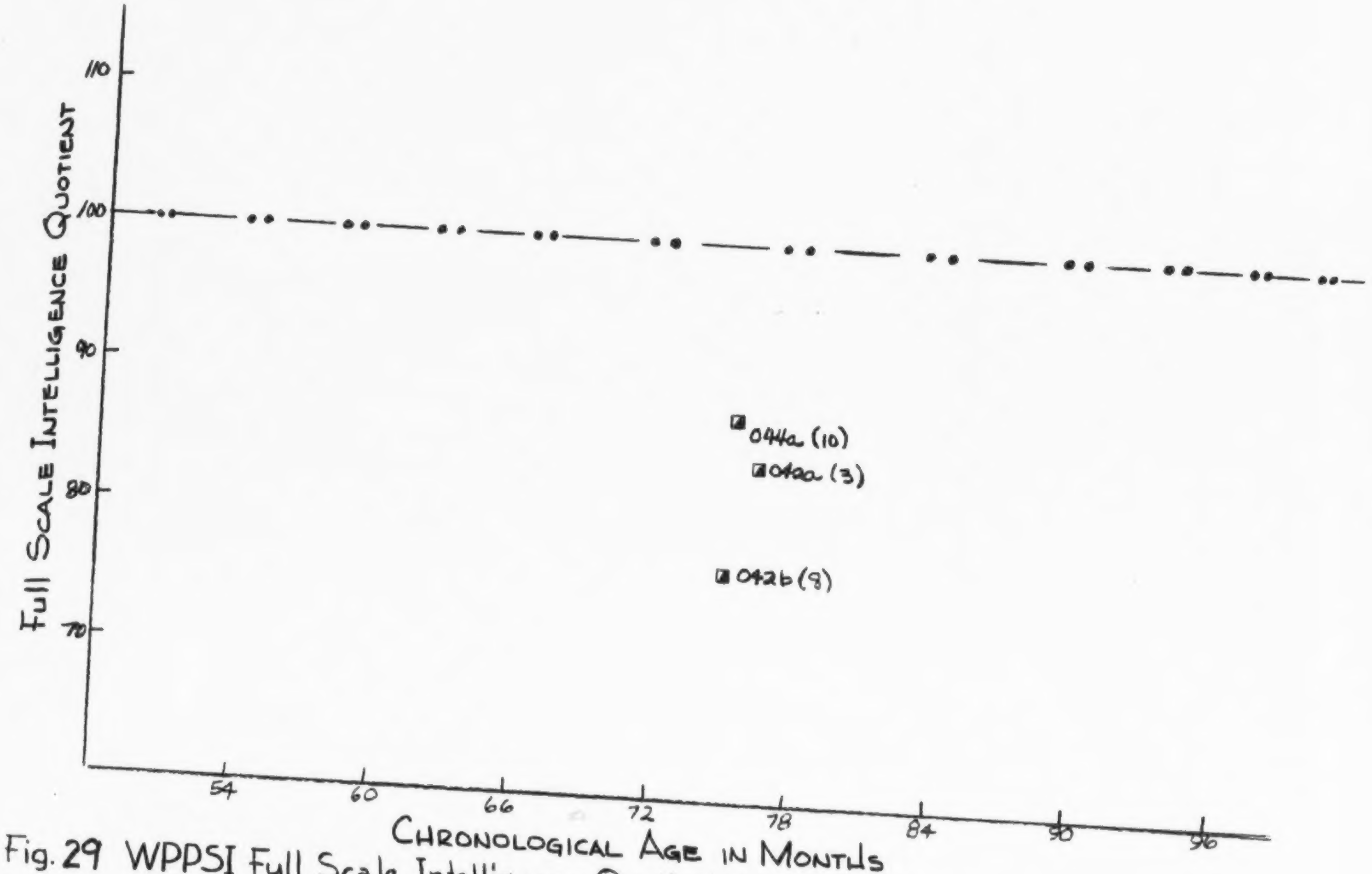

Fig. 29 WPPSI Full Scale Intelligence Quotient for all experimental and control groups in Target Area D.

Tests of Statistical Significance of Observed Changes in I.Q.

Several preliminary statistical comparisons were made for this report between selected experimental and control groups to test the null hypothesis of no difference in I.Q. change among treatment groups. It was not possible to provide statistical tests relating to all of the research hypotheses and questions in time to be included in this report. However, a number which are of major importance were completed before the termination date of the project and these are presented here. Further analyses will be reported in reports submitted to professional journals.

Significance of I.Q. Changes in Randomly Chosen Subjects

An analysis of variance was made comparing the final Stanford-Binet I.Q. scores[1] of all randomly chosen experimental subjects (Cohort groups 011a, 011b, 011c, 012a, 021a, 022a, 031a, 032a, 041a, 041b) with randomly chosen control subjects (Cohort groups 911, 912, 921, 922, 931, 932). Both of these groups had been selected from the same target area survey lists obtained in 1965 and 1966. The experimental subjects received pretests and many tests during treatment. They also experienced the planned EIP educational interventions. The control subjects were identified by random selection in 1970 and tested only once with the Stanford-Binet in April or May 1970. The results of this analysis are presented in Tables 69 and 70.

These findings indicate that the null hypothesis of no difference can be rejected at the .01 level of confidence. The assumption is, therefore, made that the EIP intervention significantly affected the performance of the enrolled children on the Stanford-Binet test of intelligence in a desirable direction.

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[1] As was noted earlier Stanford-Binet I.Q. scores were computed from appropriate WISC or WPPSI scores using regression analysis when S-B scores were unavailable (see text on page 195).

Table 69

Final Stanford-Binet Means and Standard Deviations for Randomly Selected Experimental and Control Subjects Chosen from the Same Target Area Lists

Group Code	Group	N	Mean	S.D.
A	Randomly Selected Experimental Group	113	95.87	11.8
B	Randomly Selected Control Group	66	89.55	12.5

Note: Where in a few cases Stanford-Binet scores were not available WISC or WPPSI Total I.Q.'s were computed by regression analysis and substituted. This procedure was used in all analyses of I.Q. scores.

Table 70

Analysis of Variance of Exit I.Q. Scores for Randomly Selected Experimental and Control Subjects

Source	SS	df	MS	F ratio
Between Groups	1665.14	1	1665.14	11.47*
Within Groups	25697.14	177	145.18	
Total	27362.28	178		

$^{*}p < .01$

EIP children obtained significantly higher Stanford-Binet I.Q. scores at the end of their period of involvement in EIP than randomly selected control children who had not attended EIP (but were exposed to all other assets and liabilities of the four target area communities). No other tests were administered to the randomly selected controls (Group B) since the children were scattered all over the Durham community and time for individual testing was limited.

Significance of I.Q. Changes in all Groups - Randomly and Non-randomly Selected

Since a great many of the children enrolled in EIP programs (and most of those selected as controls) were non-randomly selected, several comparisons were made using various combinations of groups, covariates, and dependent variables.

Comparison of I.Q. Changes between Randomly Selected Experimental Cohorts and Matched Control Subjects

The ten experimental cohort groups (Group A) which were randomly selected (011a, 011b, 011c, 012a, 021a, 022a, 031a, 032a, 041a, 041b) were compared with children randomly selected from survey lists made in matched target areas (Group C). These matched target areas were selected as neighborhoods having similar social, economic, and ethnic characteristics. Four control cohort groups fell into this category: 111, 112, 121, and 122 (Group C). The results of this comparison are presented in Tables 71 and 72.

These findings argue for the rejection of the hypothesis of no difference among treatments after adjusting for differences in I.Q. at entry to EIP. The experimental programs provided by EIP apparently accounted for modest gains in Stanford-Binet I.Q. which were sustained throughout the period of treatment. The I.Q.'s of children in the matched control groups declined slightly during the period studied.

Table 71

Stanford-Binet Mean I.Q. Scores for Randomly Selected Experimental and Control Subjects Chosen from Matched Target Area Lists

Group Code	Group	N	Entry Mean	Exit Mean
A	Randomly Selected Experimental Subjects	113	93.71	95.87
C	Randomly Selected Controls from Matched Areas	29	80.62	79.59

Table 72

Analysis of Covariance of Exit I.Q. Scores of Matched Subjects with 1 Covariate (Entry I.Q.)

Source	df	YY	SS Due to Regression	SS About Regression	df	MS
Between (treatments)	1	6117.00				
Within (error)	140	31437.00	7199.96	24237.04	139	174.37
Total	141	37554.00	11432.93	26121.07	140	
Difference				1884.03	1	1884.03

F (1,139) = 10.805, significant at $p < .01$.

Comparison of I.Q. Changes between all Experimental and Non-Follow-Through Control Subjects

An analysis of variance was computed using all subjects for whom I.Q. change data were available in EIP classes and control groups except those enrolled in Follow-Through (a similar early childhood intervention program). The appropriate means are presented in Table 73 and the results of analysis of covariance in Table 74.

Table 73

Mean Entry and Exit Stanford-Binet I.Q. Scores for All Experimental and Control Subjects (exclusive of Follow-Through pupils)

Group Code	Group	N	Mean Entry I.Q.	Mean Exit I.Q.
D	EIP Subjects	254	91.35	94.48
E	Controls (excluding F-T)	125	86.75	87.21

Table 74

Analysis of Covariance of Exit I.Q. Scores of All Experimental and Control Subjects (exclusive of Follow-Through pupils) with 1 Covariate (Entry I.Q.)

Source	df	YY	SS Due to Regression	SS About Regression	df	MS
Between (treatment)	1	4425.00				
Within (error)	377	58721.00	30335.13	28385.87	376	75.49
Total	378	63146.00	33293.00	29853.00	377	
Difference				1467.13	1	1467.13

F (1,376) = 19.434, significant at $p < .001$

This analysis indicated that the null hypothesis could be rejected at the .001 level of confidence. The experimental subjects gained in I.Q. to a significantly greater degree than the non-Follow-Through control subjects. When the Follow-Through children were included in the analysis (using WISC I.Q. scores) the F increased to 22.733. Table 75 presents the relevant group means and sizes.

Table 75

Mean Entry and Exit I.Q. Scores for All EIP
and All Control Subjects (including those in Follow-Through)

Group Code	Group	N	Mean Entry I.Q.	Mean Exit I.Q.
D	EIP Subjects	254	91.35	94.48
F	Controls (including F-T)	183	88.92	88.93

ANOVA F (1,434) = 22.733, $p < .001$.
(adjusted for entry I.Q.)

Effects of Length of Treatment on Observed Differences in Exit I.Q. (adjusted for Entry I.Q.)

One finding which keeps reappearing in the literature on effects of early childhood intervention is the tendency for initial gains in I.Q. to wash out after the first year or two. To test the stability of EIP treatment effects after the initial effects of entry and testing had worn off only those subjects who had been in EIP or public school programs for 20 months (or more) were compared. The results of this analysis are presented in Tables 76 and 77.

Table 76

Mean Entry and Exit I.Q. Scores for All
EIP and Control Subjects who had been in School
Programs 20 Months or More

Group Code	Group	N	Mean Entry I.Q.	Mean Exit I.Q.
D	EIP Subjects - 20 mo. treatment	117	91.12	94.71
F	Controls (including F-T) - 20 mo. treatment	55	87.27	86.25

Table 77

Analysis of Covariance of Exit I.Q. Scores of
All Experimental and Control Subjects with 20 Months
or More of School Experience (adjusted for Entry I.Q.)

Source	df	YY	SS Due to Regression	SS About Regression	df	MS
Between (treatment)	1	2673.00				
Within (error)	170	28734.00	15630.06	13103.94	169	77.54
Total	171	31407.00	16943.88	14463.13	170	
Difference				1359.19	1	1359.19

$F(1,169) = 17.529$, $p < .001$.

These results support the rejection of the null hypothesis and acceptance of the thesis that the EIP treatment was significantly effective among those who remained in EIP for 20 months or more. Instead of finding a regression after two or more academic years, the entry to exit gains in I.Q. score made by EIP children who were in the program 3 or more academic years were almost the same as those made by the total EIP sample and no evidence of regression appeared. In comparison, public school children were found to show lower exit than entry I.Q. scores after three (or more) years of school attendance.

Comparison of I.Q. Changes between all Available Experimental and Control Subjects Tested with the ITPA at Entry

In this analysis all EIP subjects who had entry ITPA scores were included regardless of the manner of selection (whether for the Infant Project, recruited door to door, selected by target area principals, referred by agencies, or requested admission by parents). The effects of EIP treatments were compared with the normal treatments provided by the community in local public and private schools and/or the neighborhood. No Follow-Through subjects, however, were administered the ITPA (Tables 78 and 79).

Table 78

Mean Stanford-Binet I.Q. and ITPA Language Age Scores for All Experimental and Control Subjects Tested with the ITPA at Entry

Group Code	Group	N	Mean Entry ITPA	Entry I.Q.	Mean Exit I.Q.
D	EIP Subjects (with I.Q. and ITPA)	192	65.37	90.55	93.50
F	Control Subjects (with I.Q. and ITPA)	32	74.34	90.78	90.00

Table 79

Analysis of Covariance of Exit I.Q. Scores with 2 Covariates (Entry ITPA and Entry I.Q.)

Source	df	YY	SS Due to Regression	SS About Regression	df	MS
Between (treatments)	1	336.00				
Within (error)	222	36172.00	18348.98	17823.02	220	81.0137
Total	223	36508.00	18171.97	18336.03	221	
Difference				513.01	1	513.01

$F(1,220) = 6.332$, $p < .05$

This analysis led to the rejection of the null hypothesis at the .05 level of confidence. EIP subjects gained in tested I.Q. while control subjects declined slightly, even though the control subjects were more mature, linguistically, at entry. When the exit I.Q.'s were adjusted for differences in entry I.Q. and ITPA the difference between groups in exit I.Q. was statistically significant at the .05 level.

Effects of EIP Interventions on the Distribution of I.Q. Scores

Arthur Jensen has commented in the Harvard Educational Review (1969) on the "actual" distribution of I.Q.'s in the population (p.24). He points out that "there are more very low I.Q.'s than would be expected in a truly normal distribution, and also there is an excess of I.Q.'s at the upper end of the scale." Jensen makes note, as well, of a slight excess of cases in the I.Q. range between 70 and 90. A second distribution of defective persons with I.Q.'s below 60 is mentioned in his discussion and an accompanying illustration (Figure 2, p. 25) shows the two overlapping distributions.

For comparison with Jensen's reported distribution of actual population I.Q.'s the distributions of EIP experimental subjects and their controls were plotted. The data are represented graphically in Figures 30 and 31.

The two figures have several points of interest. The second, overlapping distribution of I.Q.'s below 60 mentioned by Jensen shows up in the EIP entry scores, in both the black and white samples. The EIP experimental population included a majority of randomly drawn subjects. In contrast, the control distributions did not include any cases below 57. Since the controls included in these data were drawn from public schools one possibility is that the children with I.Q.'s lower than 60 were screened out.

Another point of interest relates to the changes found in the I.Q. distributions of both black and white children in the EIP sample. The effect of the EIP programs was to eliminate the bimodal shape of the EIP distributions and move them to the right (that is, to increase the means). The two control distributions remained about the same.

These results suggested that the greatest effects of the EIP programs were upon the children at the two extremes of the distributions. Children who usually might have been excluded from entry to public school were enabled to perform at a level closer to the norm for the local public schools (as represented by the controls) and children at the upper extreme were able to demonstrate more complex (Level II?) patterns of thought.

These results are sufficiently dramatic to call into question the assumption made by Jensen (p. 116, Fig. 20) that Level II developmental patterns are fixed in low socio-economic status populations. EIP programs were intended to teach problem-solving (without teaching test items per se). The results

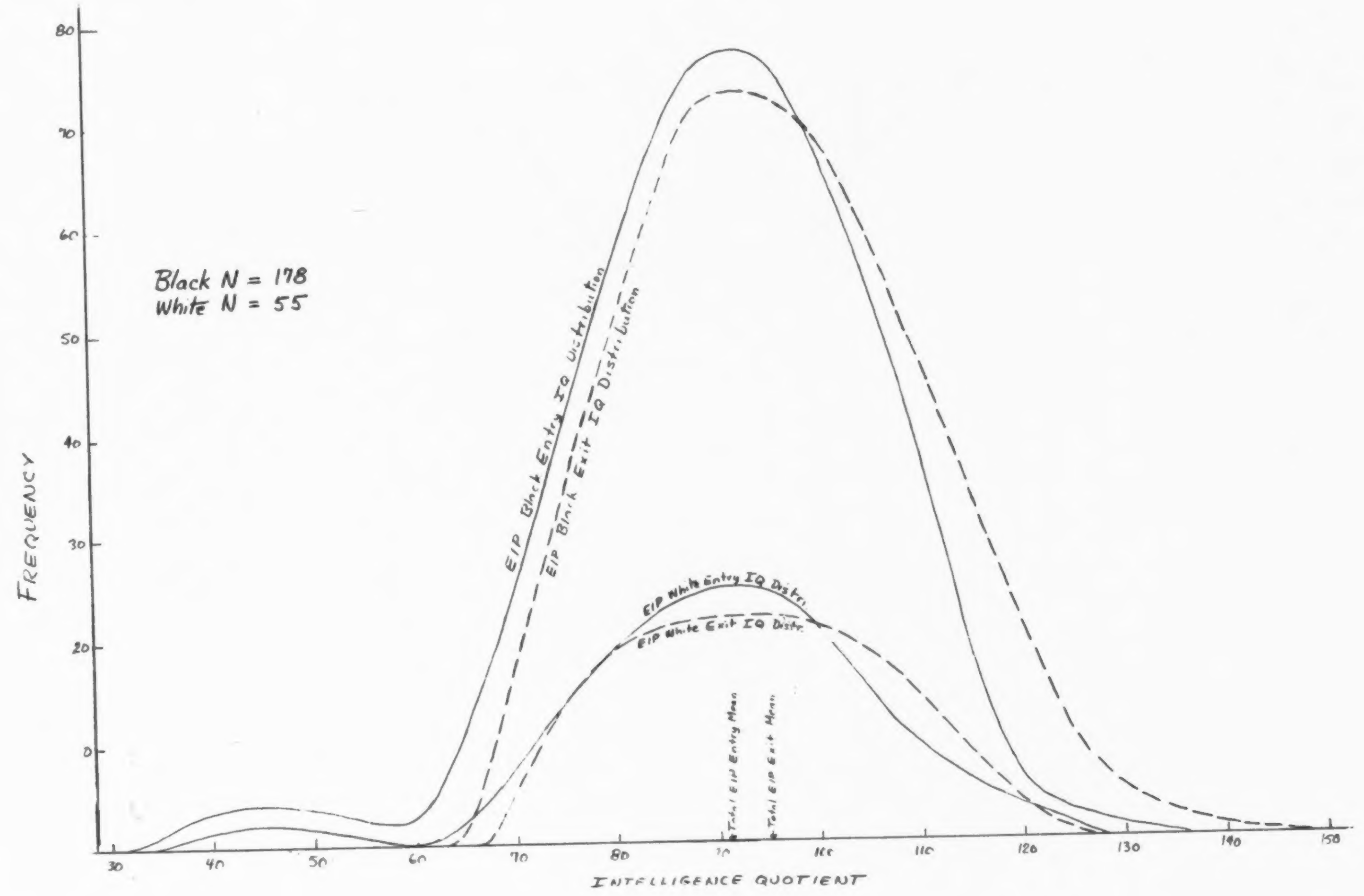

Fig. 30 Frequency distribution of EIP I.Q. scores at entry and at exit.

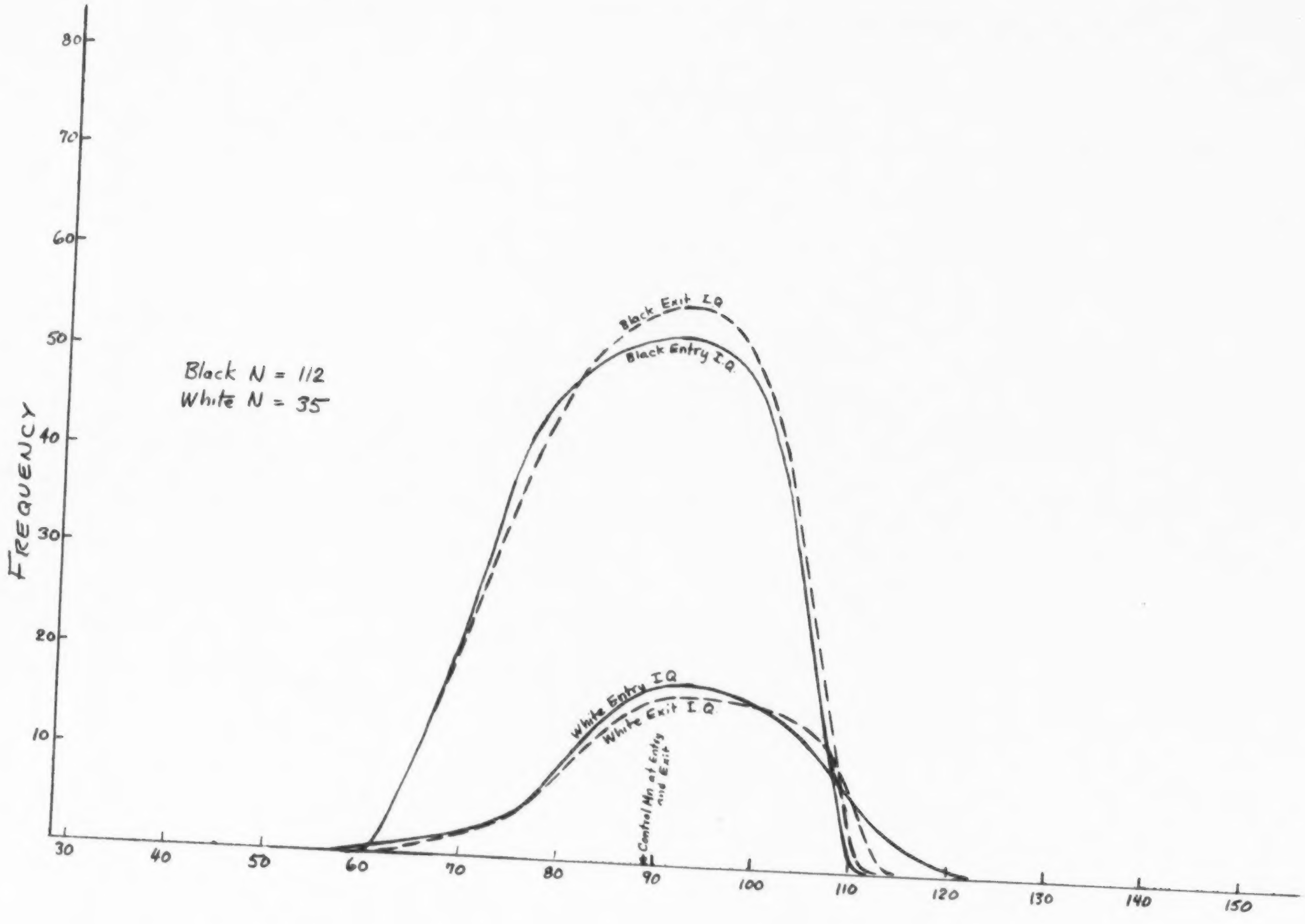

Fig. 31 Frequency distribution of control I.Q. scores at entry and at exit.

obtained for the control children (enrolled in schools emphasizing associative learning) support Jensen's position. The results from EIP treatment do not. Jensen's position is tenable, perhaps, only as long as schools are not structured to teach the cognitive skills and develop the conceptual structures which characterize higher forms of intelligence (Level II).

Jensen's analysis of traditional methods of classroom instruction (p. 115) makes a point of the emphasis commonly made on cognitive learning and he traces this to the development of public school teaching methods in populations having middle-class characteristics. Public school authorities do value problem-solving and complex thinking and teachers expect children to be able to think. However, problem-solving in young children is rarely _taught_. It is sometimes rewarded and cherished when it is found but teachers do not, generally, set out in kindergarten or the early grades to foster or develop it. When it occurs it most likely has been taught by parents.

The EIP findings suggest that teachers _can_ teach young children to think and that the results obtained in previous studies of disadvantaged children in public school populations are not likely to be replicated if early interventions are geared to the teaching of thinking. In contrast, to teach in a manner which emphasizes associative learning (Level I) as Jensen suggests, would tend to confirm previous findings and further institutionalize a pattern of intellectual bondage accidentally created in the past by impersonal socio-economic forces and well-meaning public school personnel.

Effects of EIP Treatments on Academic Achievement

The Metropolitan Achievement Test (MAT), Primary I, II and Elemetary batteries, was used to measure academic progress. These instruments had been used in the past by the cooperating schools in Durham and they have been employed in a variety of contemporary studies of the influence of early childhood educational interventions.

Data obtained on experimental and control subjects for each of the MAT forms and subtests in each of the target areas are presented in Tables 80 through 83. Figures 32 through 56 display the same data graphically.

Table 80

Metropolitan Achievement Test
Means and Standard Deviations for Target Area A
for 1968 through 1970

Group	Proj. Yr.	N	Date of Admin.	C.A.	Battery-Form	Word Know.		Word Disc.		Reading		Arithmetic Concepts and Skills	
				Mn.		Mn.	S.D.	Mn.	S.D.	Mn.	S.D.	Mn.	S.D.
011a**	5	4	S 70	85.0	Prim.I-A	45.8	10.6	46.0	6.1	46.3	9.0	38.5	9.4
011c**	5	6	S 70	83.0	Prim.I-A	37.8	9.1	41.2	5.7	42.3	5.4	36.0	4.4
011d**	5	2	S 70	85.0	Prim.I-A	39.5	14.8	39.0	14.1	41.0	5.7	35.0	8.5
012a	4	12	S 69	84.6	Prim.I-A	38.8	9.3	39.6	10.1	40.3	9.2	43.5	9.5
	5	12	S 70	93.4	Prim.II-C	45.4	8.8	47.3*	11.6	44.3	10.5	43.4[a]	7.9
012c	4	9	S 69	84.3	Prim.I-A	39.7	6.5	42.2	8.4	41.3	2.7	47.9*	6.6
	5	9	S 70	95.0	Prim.II-C	44.9	4.6	49.2*	5.3	42.1	8.3	45.6[a]	7.1
212	4	24	S 69	84.9	Prim.I-A	42.2	8.5	43.4	8.4	43.0	6.7	37.3	9.6
	5	24	S 70	96.0	Prim.II-C	37.7	7.8	39.7	8.2	36.8	7.1	36.0[a]	8.8

Group	Proj. Yr.	N	Date of Admin.	C.A.	Battery-Form	Spelling		Total Language		Arith. Comput.		Arithmetic Problem Solving and Concepts	
				Mn.		Mn.	S.D.	Mn.	S.D.	Mn.	S.D.	Mn.	S.D.
012a	5	12	S 70	93.4	Prim.II-C	48.3*	10.9	--	--	--	--	--	--
012c	5	9	S 70	95.0	Prim.II-C	52.3*	8.1	--	--	--	--	--	--

[a] Primary II Arithmetic is a total Arithmetic score composed of "Problem Solving and "Concepts" and "Computations."

Note: All scores expressed as standard scores computed from the MAT statistics manual.

* Above MAT Subtest norm.
** EIP "graduate" cohort (enrolled in public school).

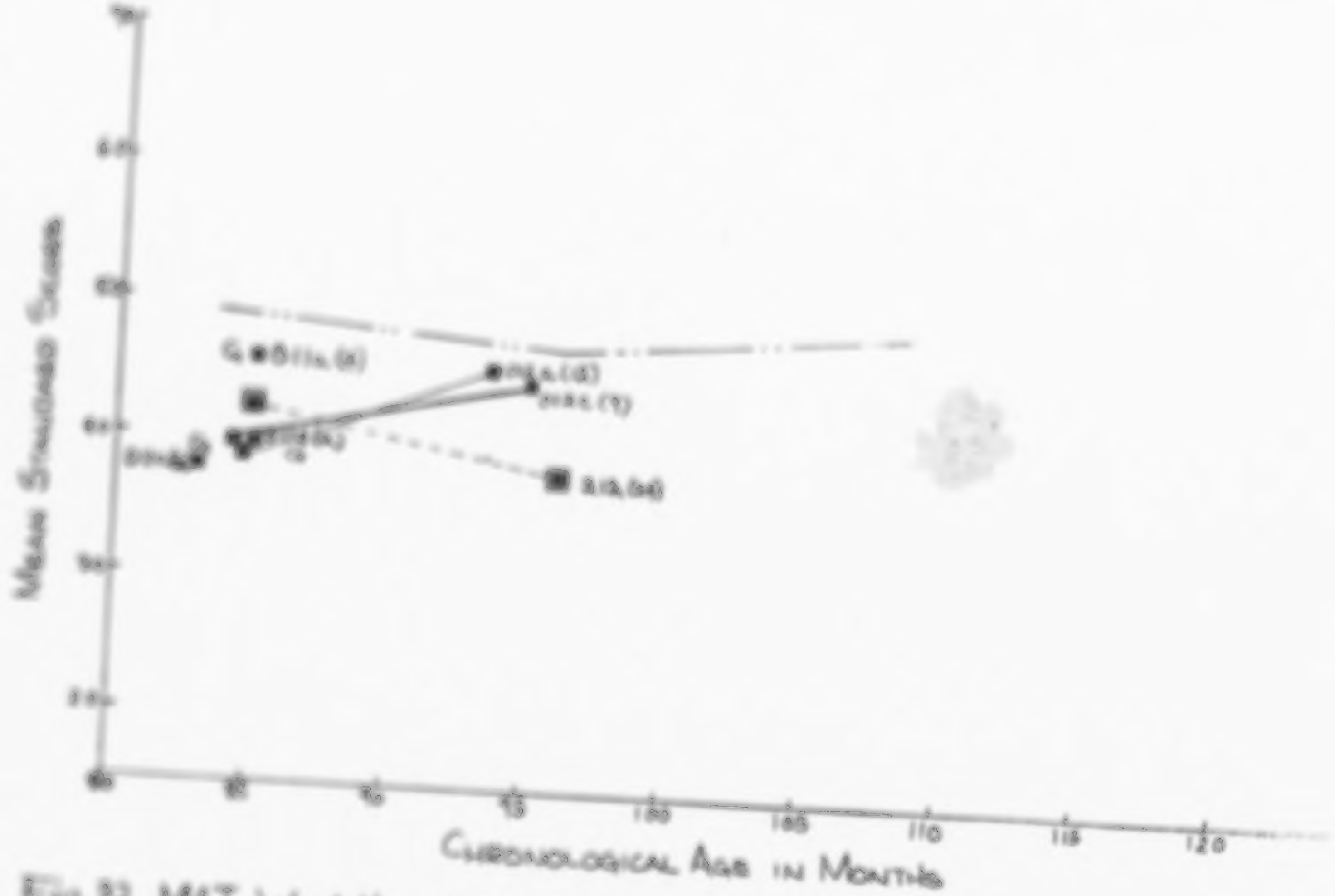

Fig.32 MAT Word Knowledge for all experimental and control groups in Target Area A.

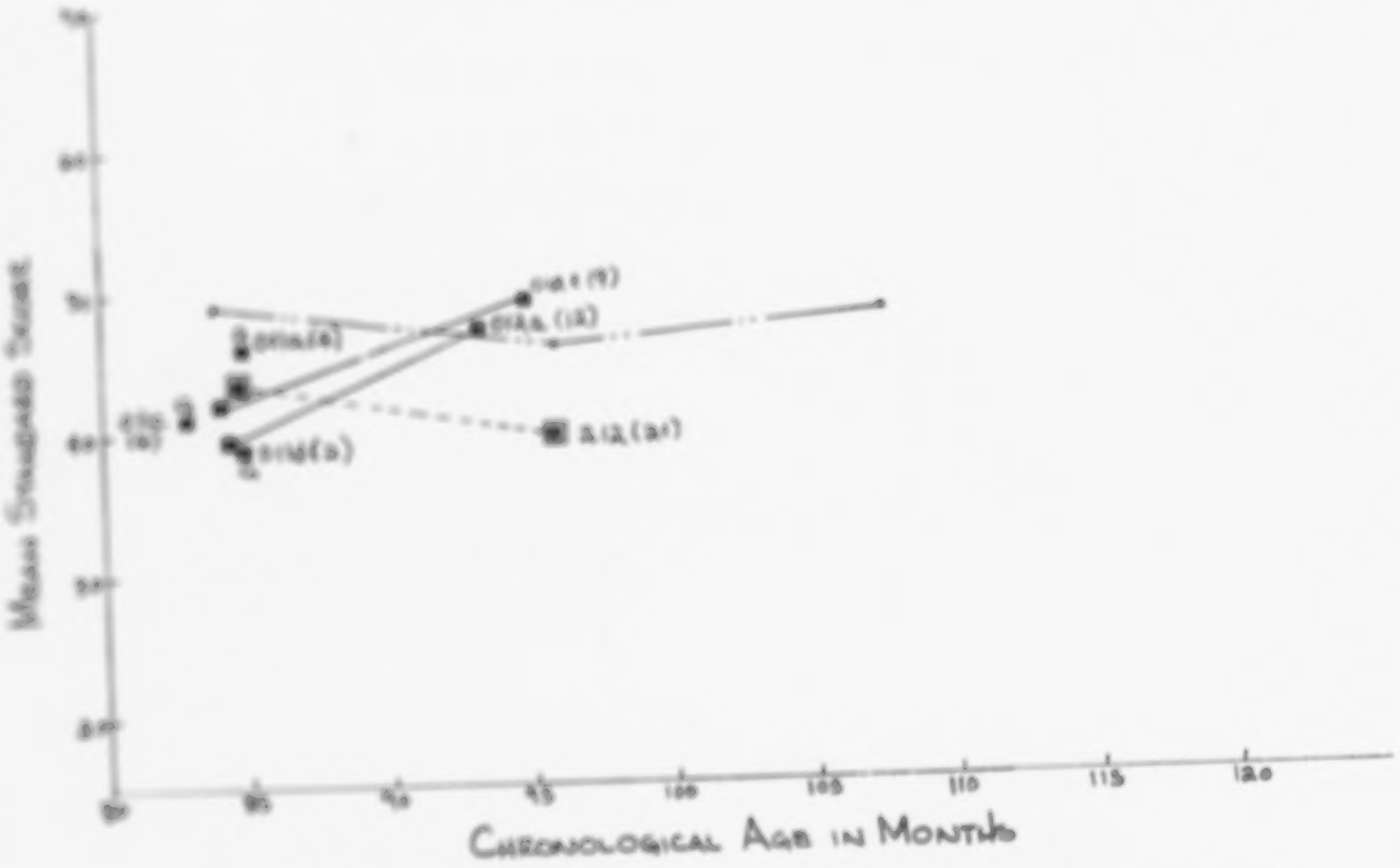

Fig. 33 MAT Word Discrimination for all experimental and control groups in Target Area A.

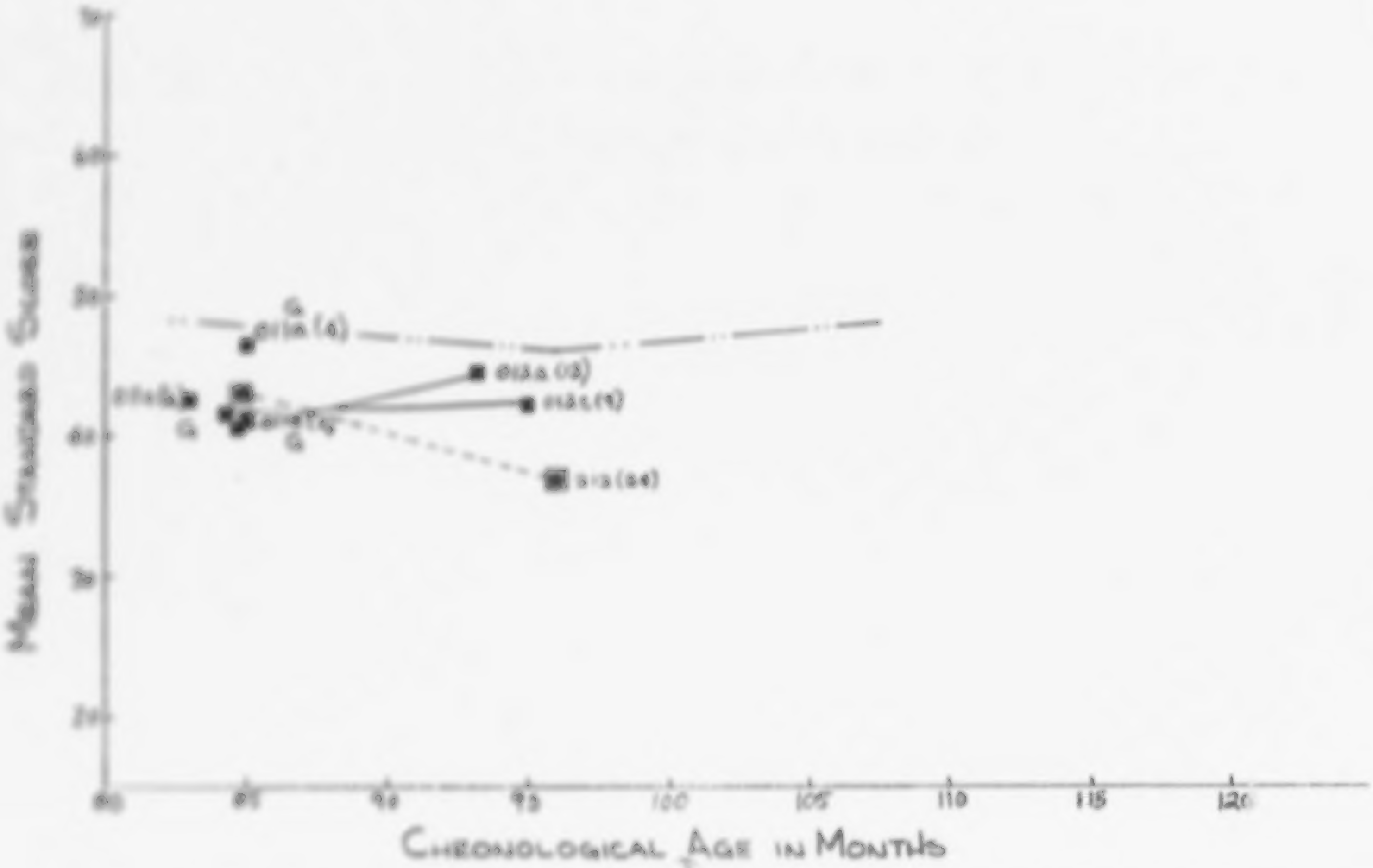

Fig. 34 MAT Reading for all experimental and control groups in Target Area A.

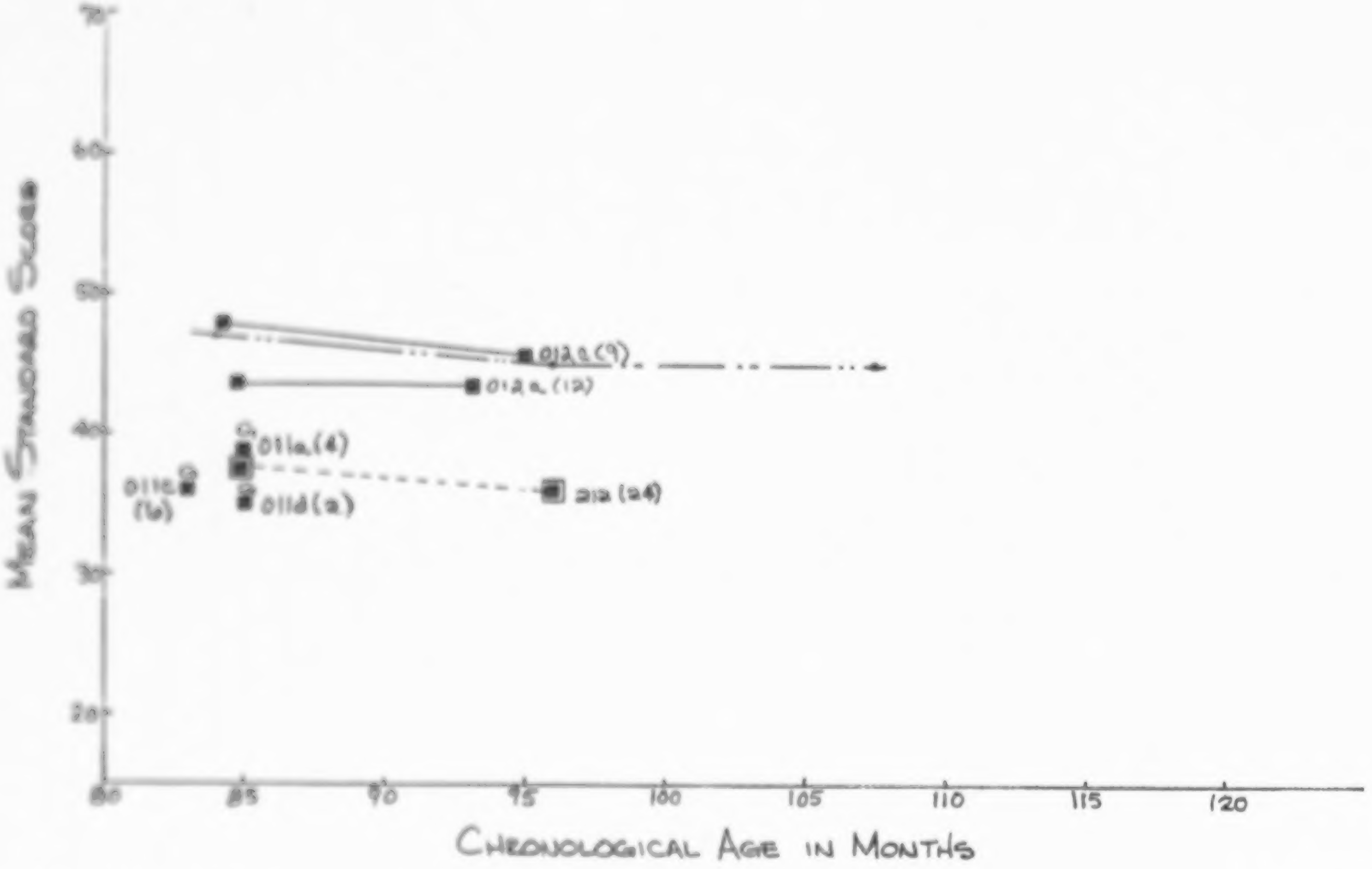

Fig. 35 MAT Arithmetic for all experimental and control groups in Target Area A.

Table 81

Metropolitan Achievement Test
Means and Standard Deviations for Target Area B
for 1968 through 1970

Group	Proj. Yr.	N	Date of Admin.	C.A.	Battery-Form	Word Know.		Word Disc.		Reading		Arithmetic Concepts and Skills	
				Mn.		Mn.	S.D.	Mn.	S.D.	Mn.	S.D.	Mn.	S.D.
022a	3	6	S 68	83.5	Prim.I-A	37.5	3.7	38.8	7.0	36.8	4.7	34.7	6.8
	4	7	S 69	94.3	Prim.II-C	38.7	7.0	41.3	7.1	36.4	4.7	40.4[a]	6.6
	5	7	S 70	109.0	Elem.-C	38.3	6.0	38.6	5.0	36.0	3.7	—	—
022b	3	6	S 68	84.5	Prim.I-A	31.8	3.7	30.8	3.8	34.5	3.9	25.8	3.2
	4	7	S 69	95.7	Prim.II-C	30.7	5.3	28.7	6.0	31.6	3.4	28.4[a]	6.2
	5	7	S 70	108.6	Elem.-C	31.7	5.8	32.0	6.9	32.3	5.6	—	—
142	3	20	S 68	87.0	Prim.I-A	45.7	6.6	46.5	9.7	45.1	8.5	42.7	8.6
	4	12	S 69	98.5	Prim.II-C	41.0	7.7	43.7	8.3	39.8	11.3	41.6[a]	9.5
	5	19	S 70	110.1	Elem.-C	40.4	9.7	43.1	8.2	40.3	6.7	—	—
444	5	10	S 70	95.3	Prim.II-C	33.9	6.6	36.3	8.2	33.9	7.7	31.8[a]	8.1
544	5	14	S 70	95.4	Prim.II-C	39.4	7.8	38.9	9.9	38.7	8.6	36.3[a]	10.0

Group	Proj. Yr.	N	Date of Admin.	C.A.	Battery-Form	Spelling		Total Language		Arith. Comput.		Arithmetic Problem Solving and Concepts	
				Mn.		Mn.	S.D.	Mn.	S.D.	Mn.	S.D.	Mn.	S.D.
022a	3	6	S 68	83.5	Prim.I-A	—	—	—	—	—	—	—	—
	4	7	S 69	94.3	Prim.II-C	41.3	5.0	—	—	—	—	—	—
	5	7	S 70	109.0	Elem.-C	41.3	8.2	34.7	6.0	38.3	8.3	29.4	6.8
022b	3	6	S 68	84.5	Prim.I-A	—	—	—	—	—	—	—	—
	4	6	S 69	95.7	Prim.II-C	31.2	2.8	—	—	—	—	—	—
	5	6	S 70	108.6	Elem.-C	29.1	4.4	30.4	4.3	25.1	2.5	27.9	3.2
142	3	20	S 68	87.0	Prim.I-A	—	—	—	—	—	—	—	—
	4	12	S 69	98.5	Prim.II-C	45.2	7.2	—	—	—	—	—	—
	5	19	S 70	110.1	Elem.-C	44.0	10.0	38.9	8.7	37.5	9.1	37.1	8.1
444	5	10	S 70	95.3	Prim.II-C	40.3	3.4	—	—	—	—	—	—
544	5	14	S 70	95.4	Prim.II-C	40.5	8.5	—	—	—	—	—	—

[a] Primary II Arithmetic is a total Arithmetic score composed of "Problem Solving and "Concepts" and "Computations."

Note: All scores expressed as standard scores computed from the MAT statistics manual.

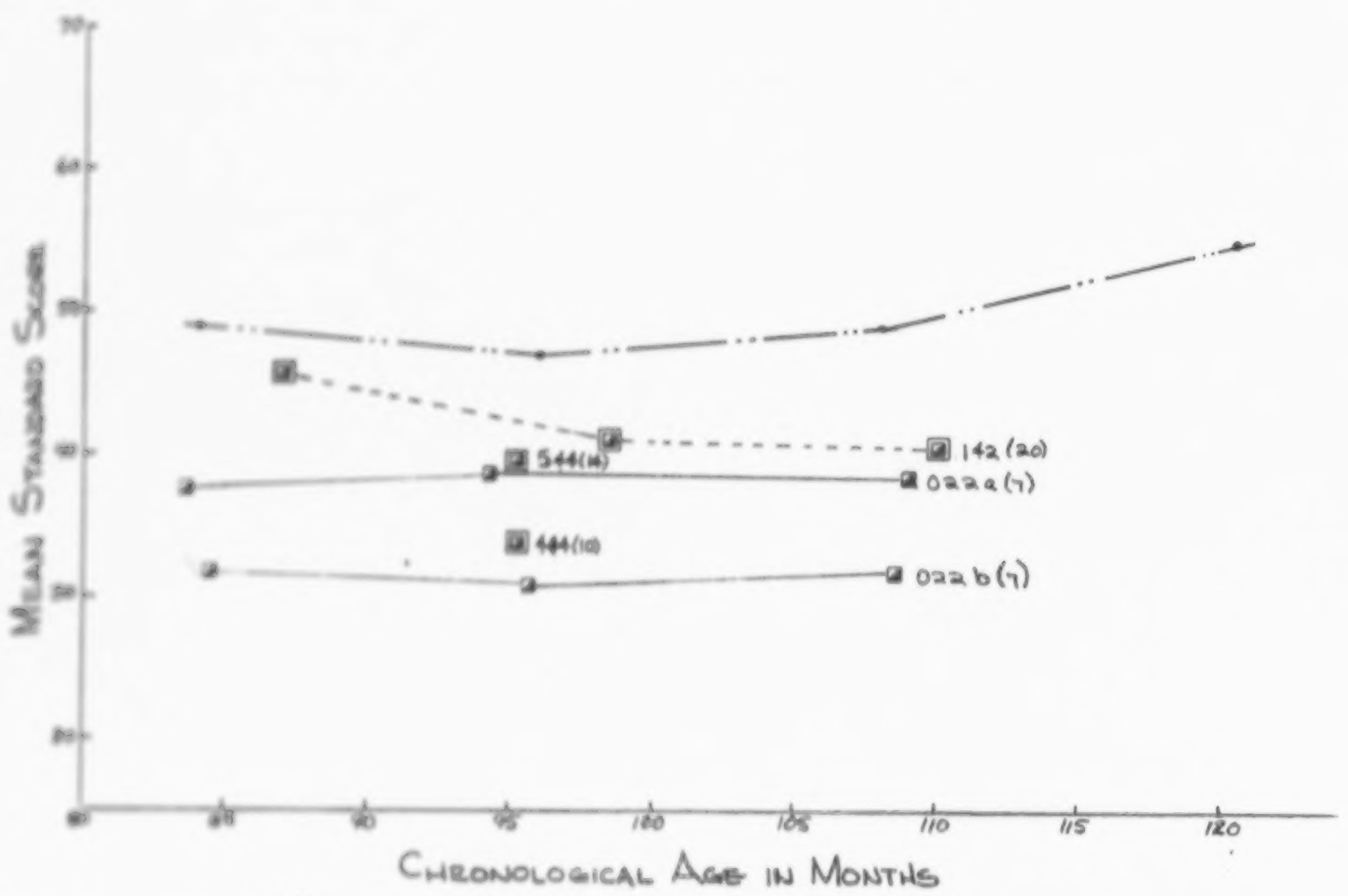

Fig. 36 MAT Word Knowledge for all experimental and control groups in Target Area B.

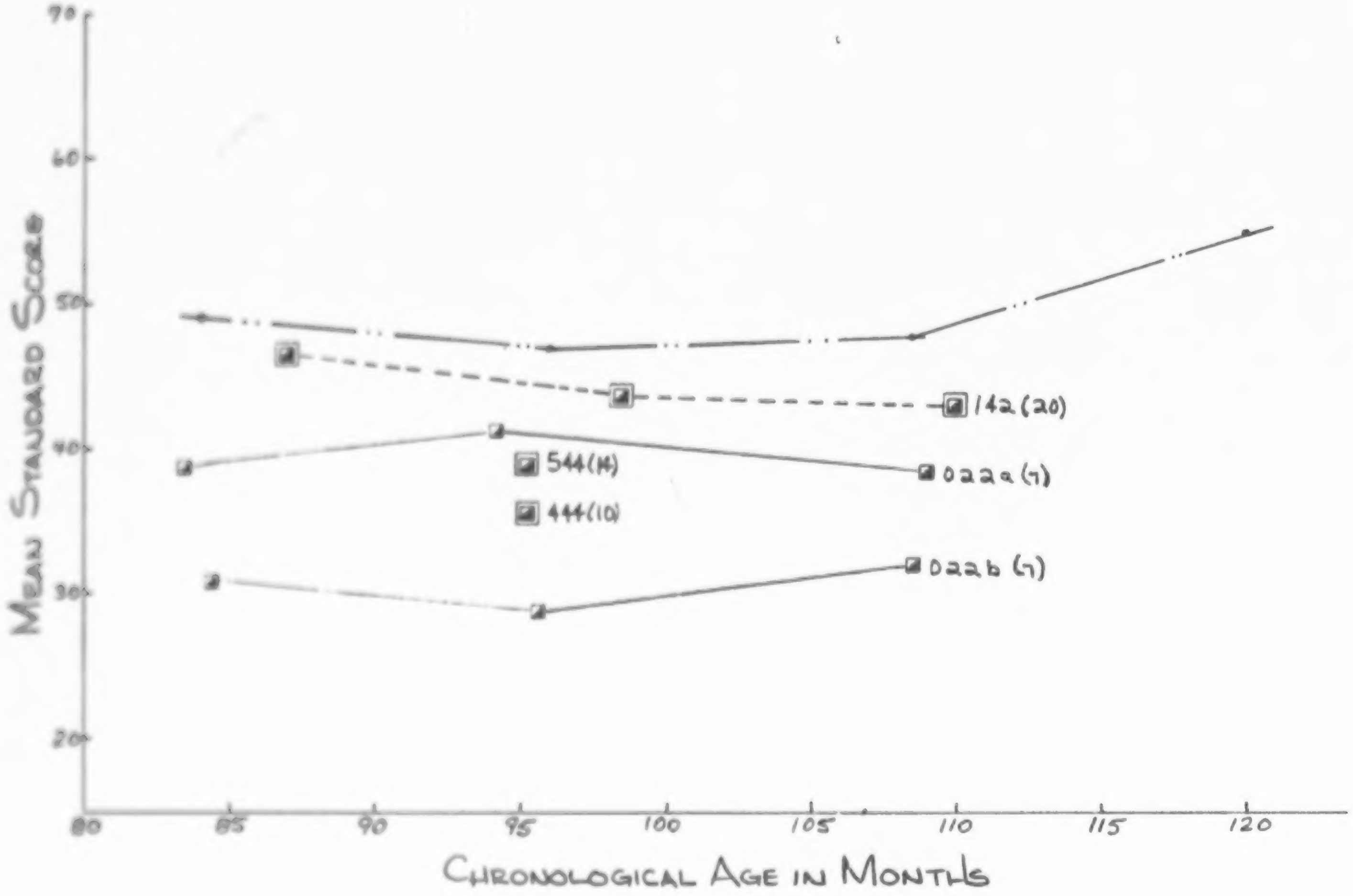

Fig. 37 MAT Word Discrimination for all experimental and control groups in Target Area B.

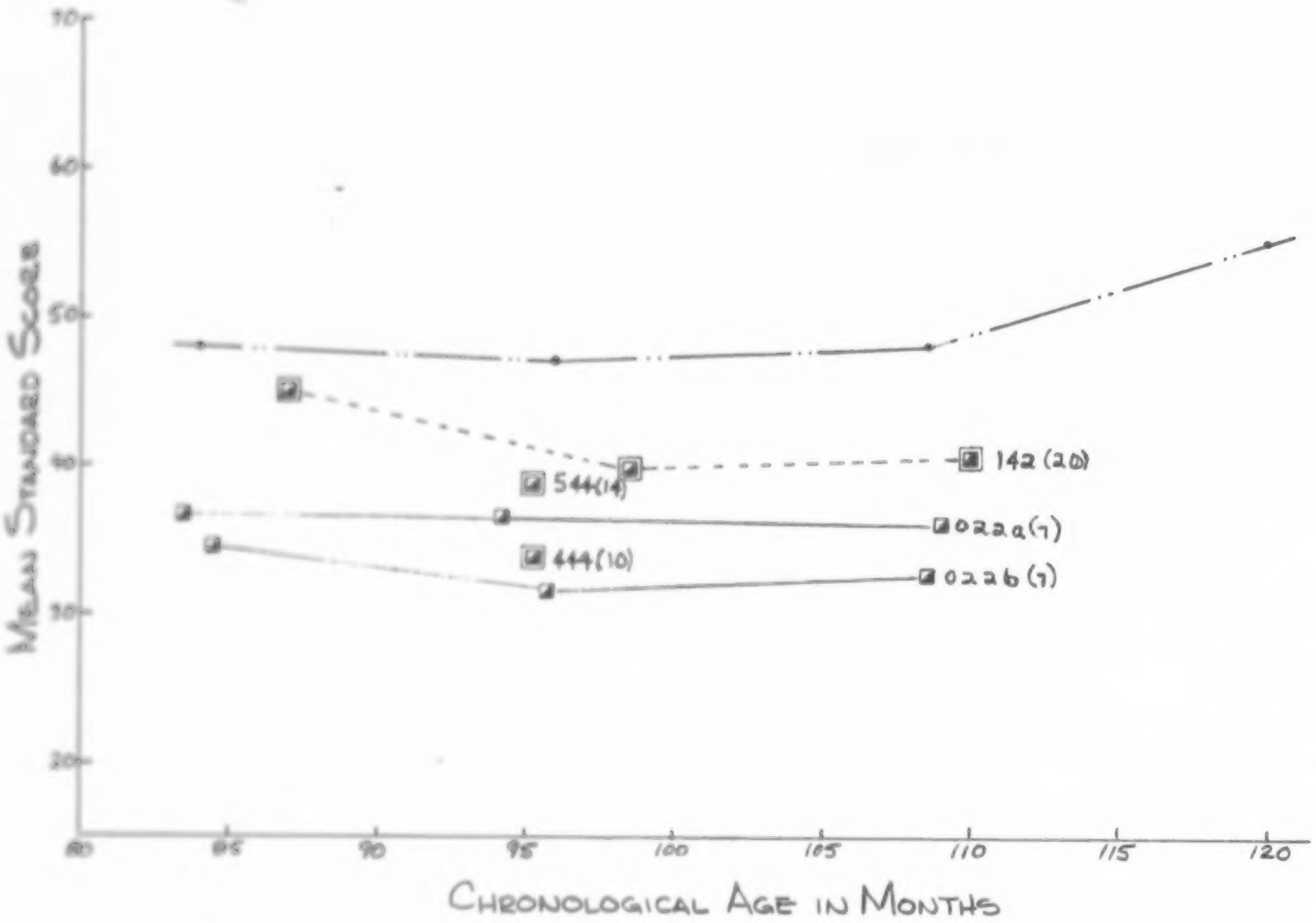

Fig. 38 MAT Reading for all experimental and control groups in Target Area B.

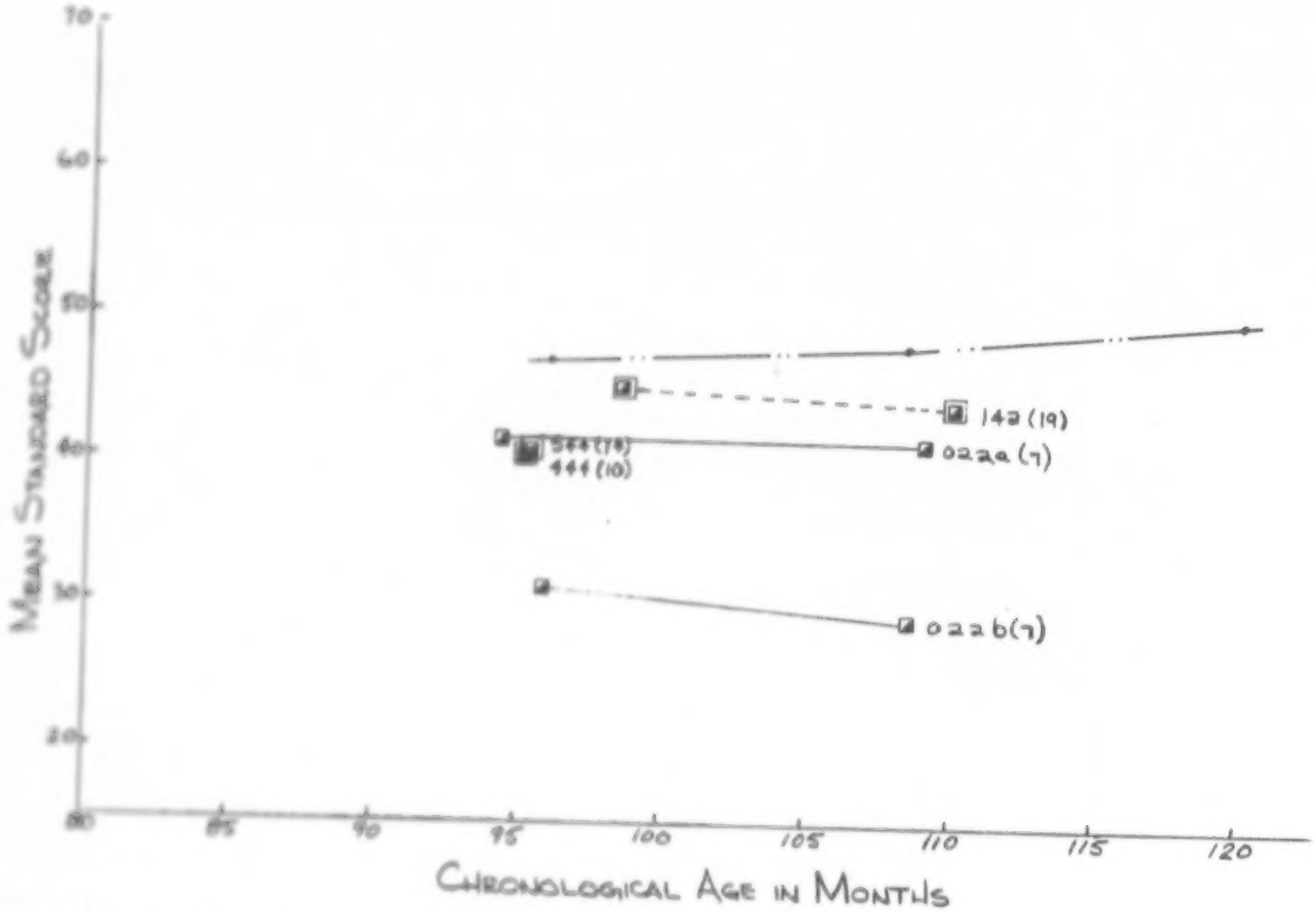

Fig. 39 MAT Spelling for all experimental and control groups in Target Area B.

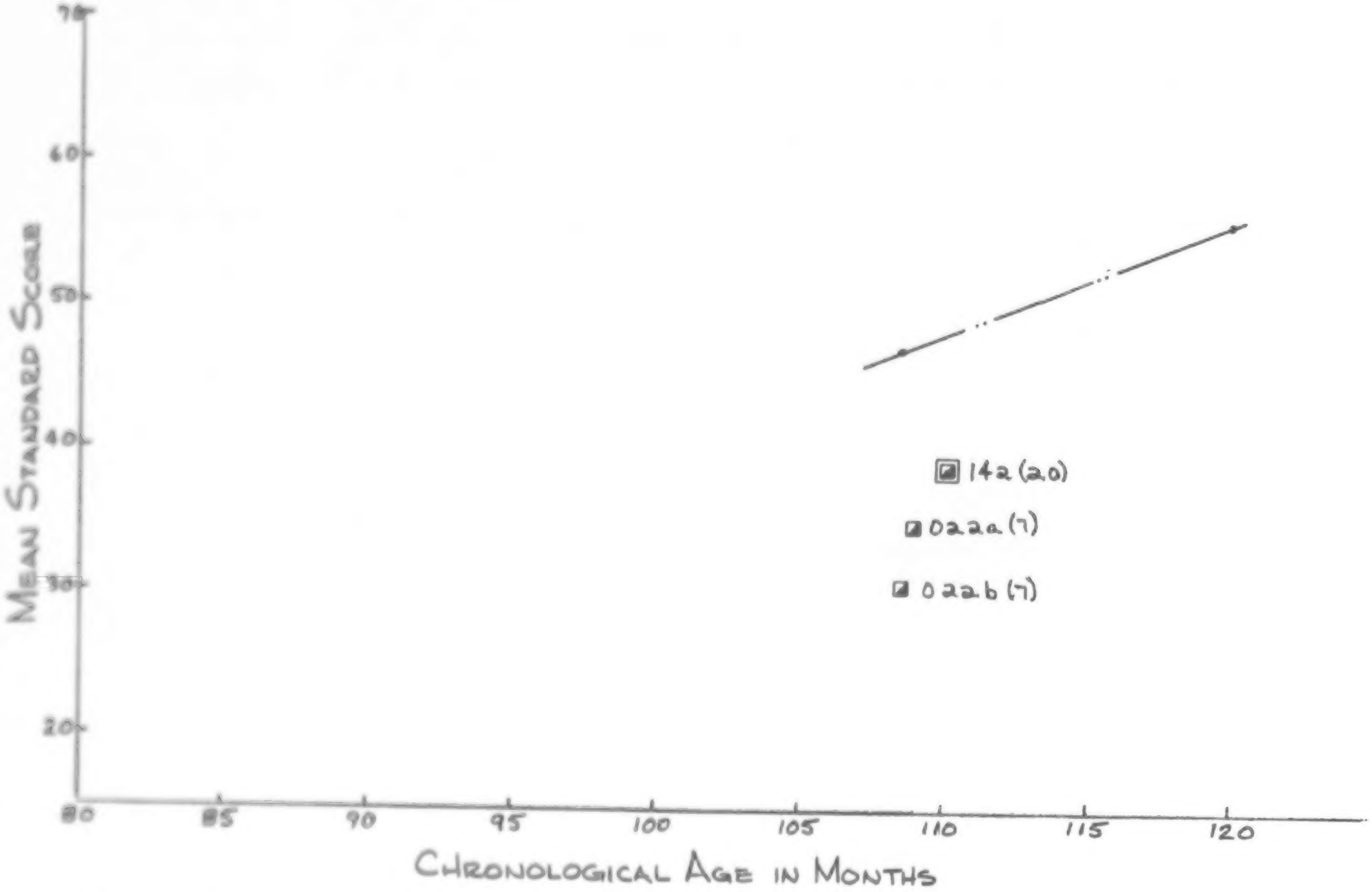

Fig. 40 MAT Language for all experimental and control groups in Target Area B.

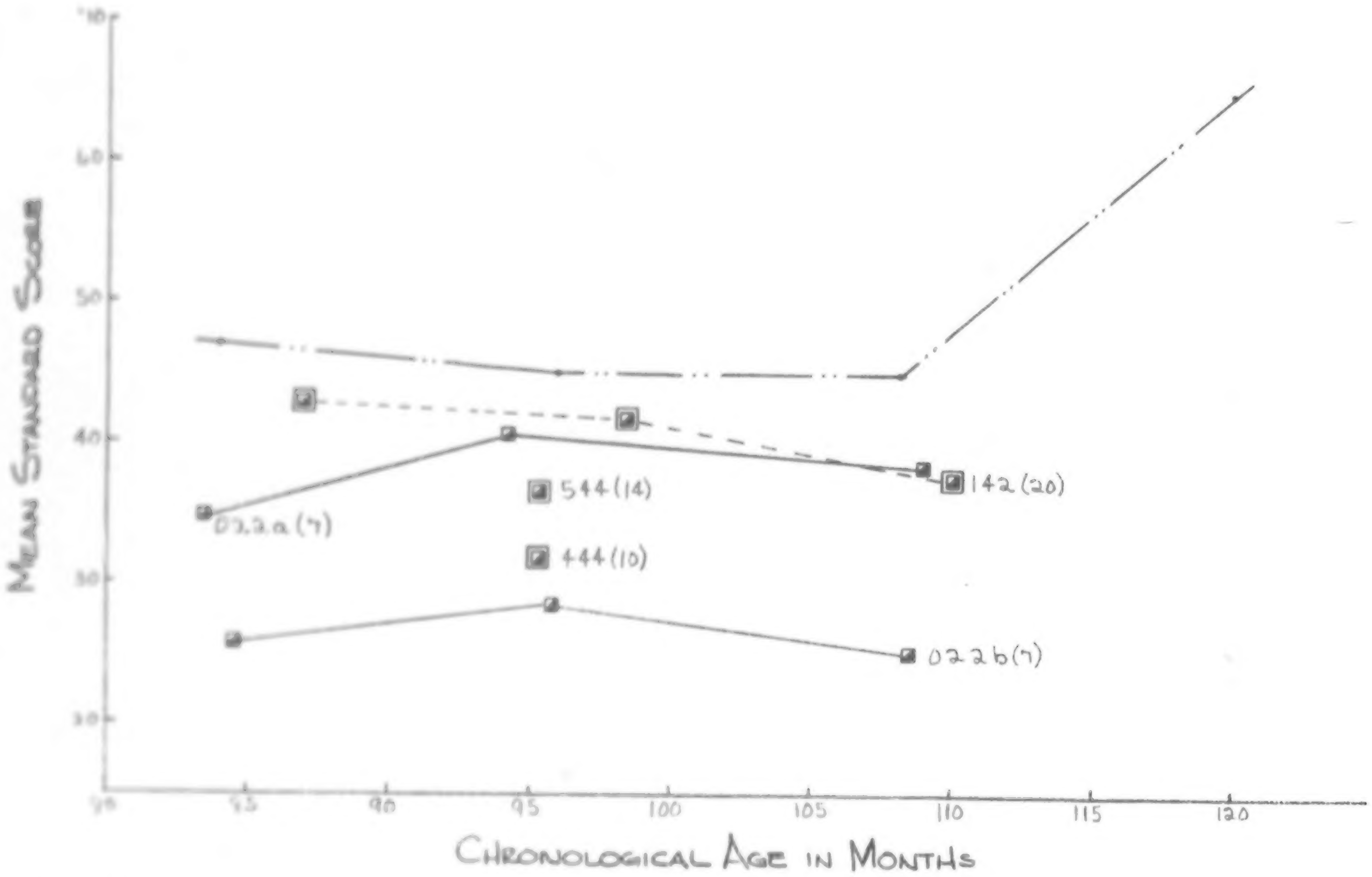

Fig. 41 MAT Arithmetic Concepts and Skills (Primary Form) and Computation (Elementary Form) for all experimental and control groups in Target Area B.

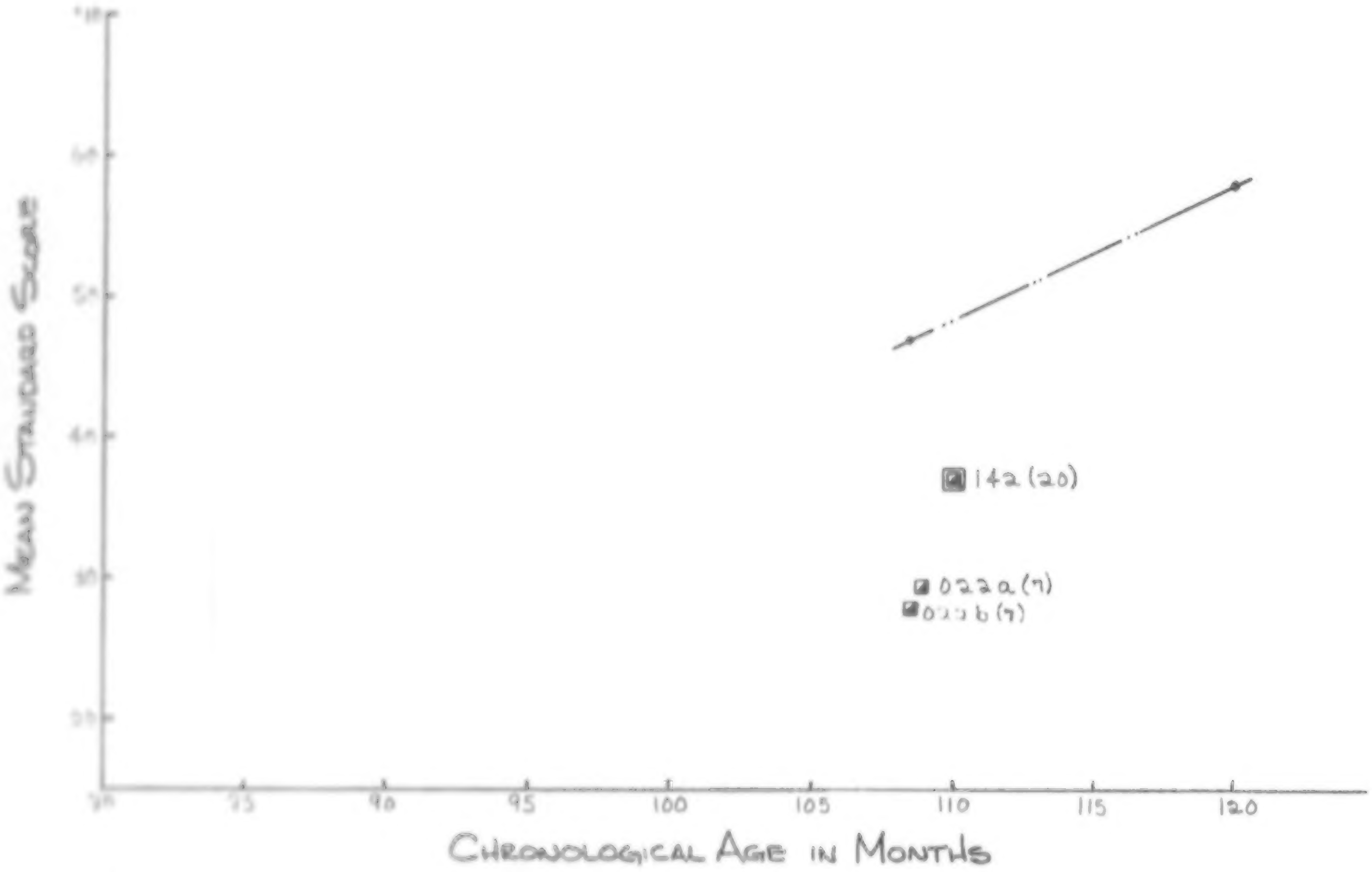

Fig. 42 MAT Arithmetic Problem Solving and Concepts (Elementary Form) for all experimental and control groups in Target Area B.

Table 82

Metropolitan Achievement Test
Means and Standard Deviations for Target Area C
for 1967 through 1970

Group	Proj. Yr.	N	Date of Admin.	C.A.	Battery-Form	Word Know.		Word Disc.		Reading		Arithmetic Concepts and Skills	
				Mn.		Mn.	S.D.	Mn.	S.D.	Mn.	S.D.	Mn.	S.D.
031a	2	17	S 67	84.6	Prim.I-A	41.9	10.8	46.0	12.0	43.9	9.3	52.2*	8.8
	3	16	S 68	96.6	Prim.II-C	48.6*	10.9	51.6*	9.1	45.4	10.7	48.9[a]*	9.4
	4	17	S 69	108.5	Elem.-C	45.7	9.4	46.6	8.1	45.2	7.7	--	--
	5	17	S 70	121.0	Elem.-C	49.4	9.0	48.6	8.7	46.6	9.0	--	--
031b	2	4	S 67	81.5	Prim.I-A	46.5	18.0	50.3*	16.0	53.3*	14.8	54.5*	7.9
	3	4	S 68	93.5	Prim II-C	53.8*	9.9	55.0*	9.0	55.5*	12.0	53.0[a]*	14.1
	4	4	S 69	105.3	Elem.-C	53.3*	12.6	54.3*	8.7	53.8*	10.6	--	--
	5	4	S 70	117.5	Elem.-C	53.8	13.5	57.3*	4.6	54.3	14.3	--	--
031c	3	2	S 68	87.5	Prim.II-C	52.0*	4.2	59.5*	9.2	46.5	3.5	43.0[a]	0.0
	4	2	S 69	99.5	Elem.-C	45.5	6.4	48.0*	8.5	43.0	12.7	--	--
	5	2	S 70	111.5	Elem.-C	51.5	2.1	52.0	7.1	48.0	4.2	--	--
032a	5	12	S 70	83.9	Prim.I-A	42.8	7.9	44.8	8.7	42.6	5.3	38.8	10.7
032b	5	3	S 70	83.3	Prim.I-A	43.0	14.7	47.3	11.5	49.3*	9.3	44.0	12.3
032c	5	2	S 70	83.5	Prim.I-A	44.0	5.7	47.0	7.1	49.0*	2.8	42.5	.7
131	2	12	S 67	84.4	Prim.I-A	41.3	11.4	47.4	9.5	45.4	5.2	42.2	7.9
	3	10	S 68	97.6	Prim.II-C	47.6*	12.9	49.7*	11.4	48.9*	7.9	46.1[a]*	3.9
	4	9	S 69	108.1	Elem.-C	44.9	8.6	44.8	8.0	41.7	8.4	--	--
	5	12	S 70	121.3	Elem.-C	45.3	9.5	47.1	8.1	43.5	8.5	--	--
312	5	33	S 70	96.0	Prim.II-C	38.3	7.9	42.4	9.8	38.5	8.2	36.8[a]	8.3

[a] Primary II Arithmetic is a total Arithmetic score composed of "Problem Solving and "Concepts" and "Computations."

Note: All scores expressed as standard scores computed from the MAT statistics manual.

* Above MAT Subtest Norm.

Table 82 (continued)

Metropolitan Achievement Test Means and Standard Deviations
for Target Area C for 1967 through 1970

Group	Proj. Yr.	N	Date of Admin.	C.A.	Battery-Form	Spelling		Total Language		Arith. Comput.		Arithmetic Problem Solving and Concepts	
				Mn.		Mn.	S.D.	Mn.	S.D.	Mn.	S.D.	Mn.	S.D.
031a	2	17	S 67	84.6	Prim.I-A	--	--	--	--	--	--	--	--
	3	16	S 68	96.6	Prim.II-C	52.3*	11.0	--	--	--	--	--	--
	4	17	S 69	108.5	Elem.-C	53.3*	12.6	45.4	13.3	52.8*	12.3	51.2*	10.9
	5	17	S 70	121.0	Elem.-C	56.2*	10.5	53.6	10.4	60.1	14.8	51.9	11.6
031b	2	4	S 67	81.5	Prim.I-A	--	--	--	--	--	--	--	--
	3	4	S 68	93.5	Prim.II-C	59.8*	9.4	--	--	--	--	--	--
	4	4	S 69	105.3	Elem.-C	64.0*	12.1	61.0*	13.9	58.8*	18.5	59.3*	15.2
	5	4	S 70	117.5	Elem.-C	65.5*	7.5	62.8*	9.9	68.3*	12.6	57.8	13.3
031c	3	2	S 68	87.5	Prim.II-C	58.5*	6.4	--	--	--	--	--	--
	4	2	S 69	99.5	Elem.-C	58.5*	9.2	50.5*	17.7	53.5*	16.3	49.5*	7.8
	5	2	S 70	111.5	Elem.-C	62.0*	4.2	56.5*	10.6	62.5	3.5	47.5	3.5
131	2	12	S 67	84.4	Prim.I-A	--	--	--	--	--	--	--	--
	3	10	S 68	97.6	Prim.II-C	51.1*	10.5	--	--	--	--	--	--
	4	9	S 69	108.1	Elem.-C	48.4*	9.9	45.8	7.0	49.8*	8.7	37.9	7.5
	5	12	S 70	121.3	Elem.-C	52.3	12.1	50.8	9.0	51.4	12.7	42.5	8.6
312	5	33	S 70	96.0	Prim.II-C	44.5	7.1	--	--	--	--	--	--

Note: All scores expressed as standard scores computed from the MAT statistics manual.

* Above MAT Subtest Norm.

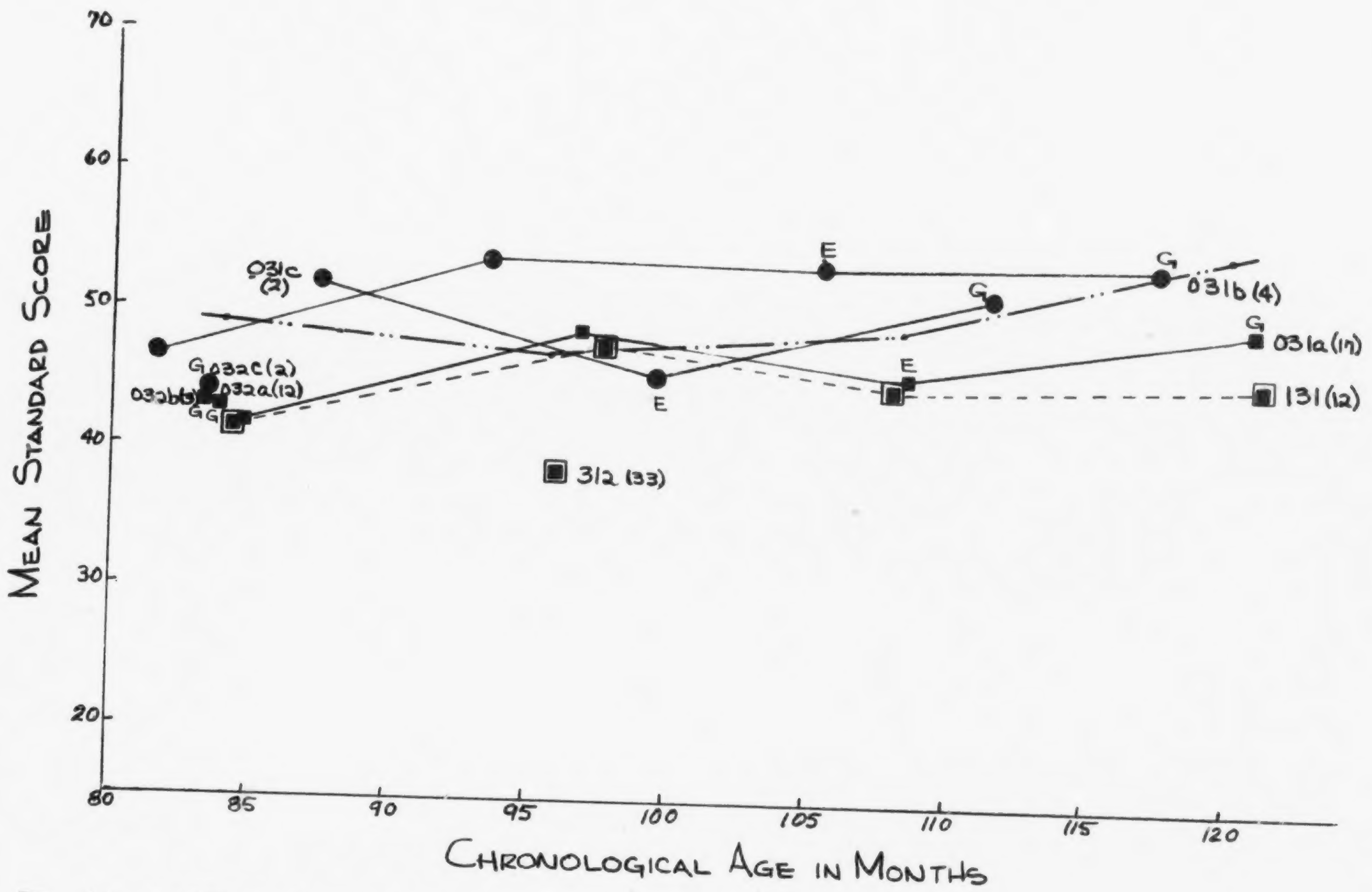

Fig. 43 MAT Word Knowledge for all experimental and control groups in Target Area C.

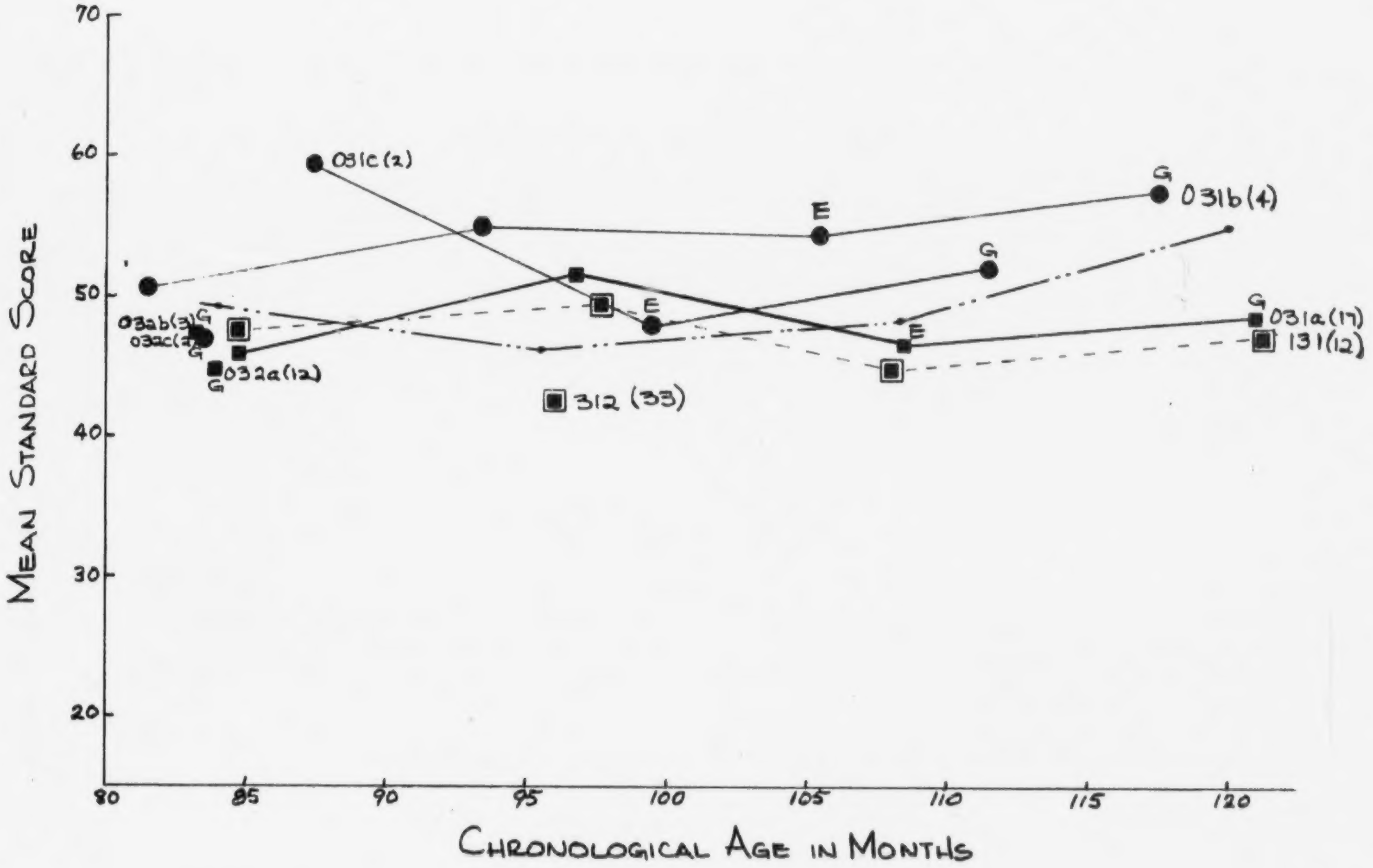

Fig. 44 MAT Word Discrimination for all experimental and control groups in Target Area C.

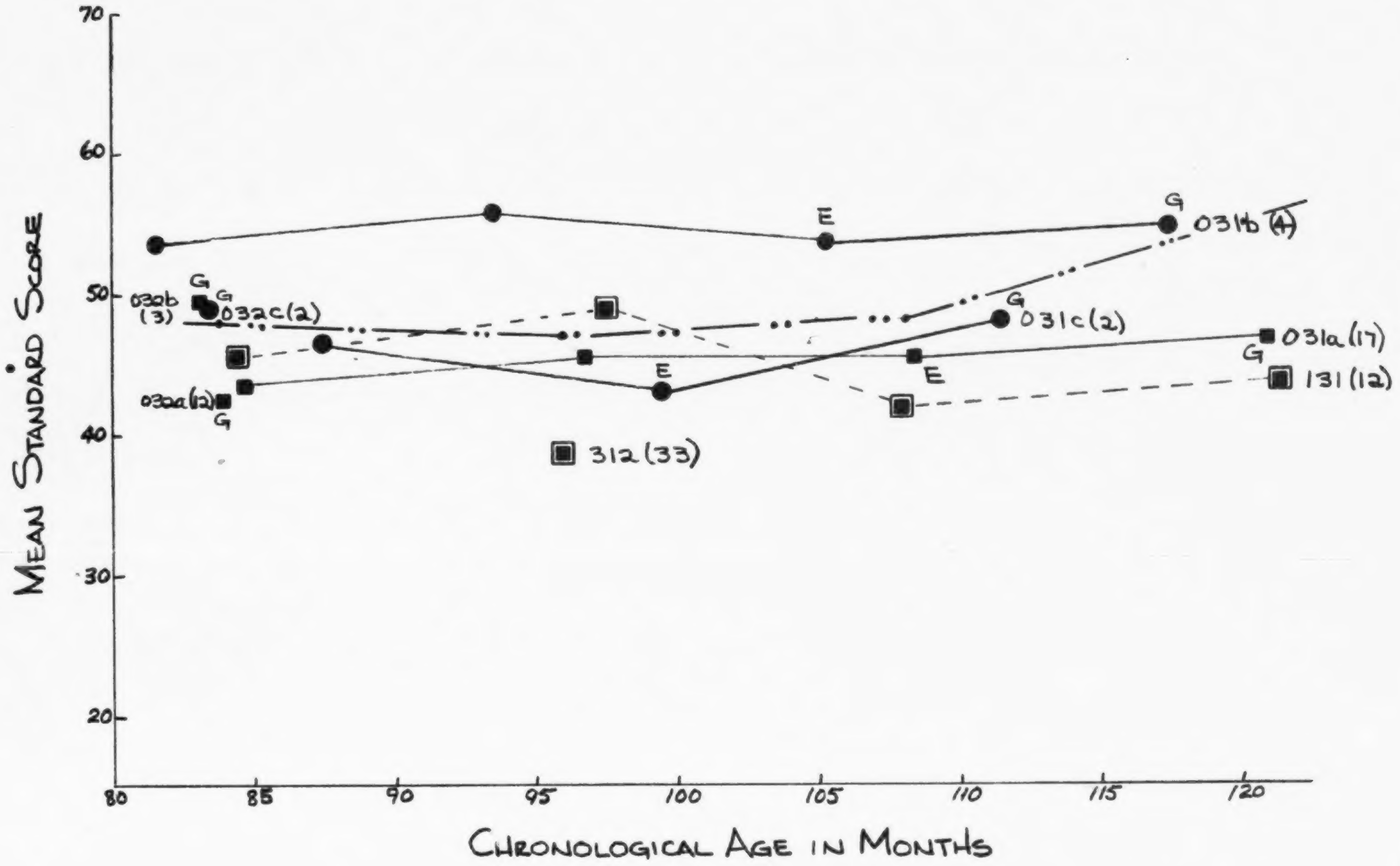

Fig.45 MAT Reading for all experimental and control groups in Target Area C.

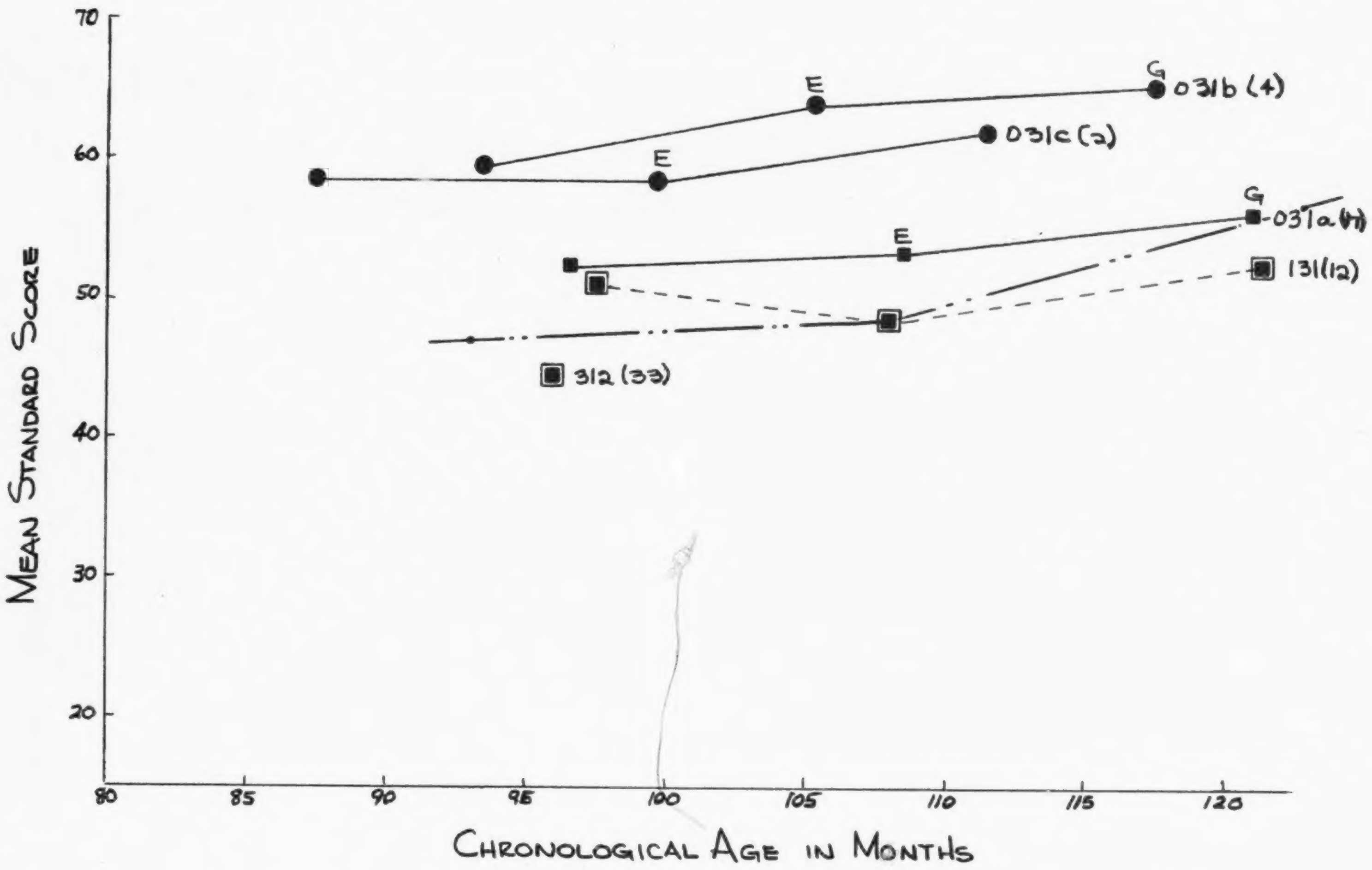

Fig. 46 MAT Spelling for all experimental and control groups in Target Area C.

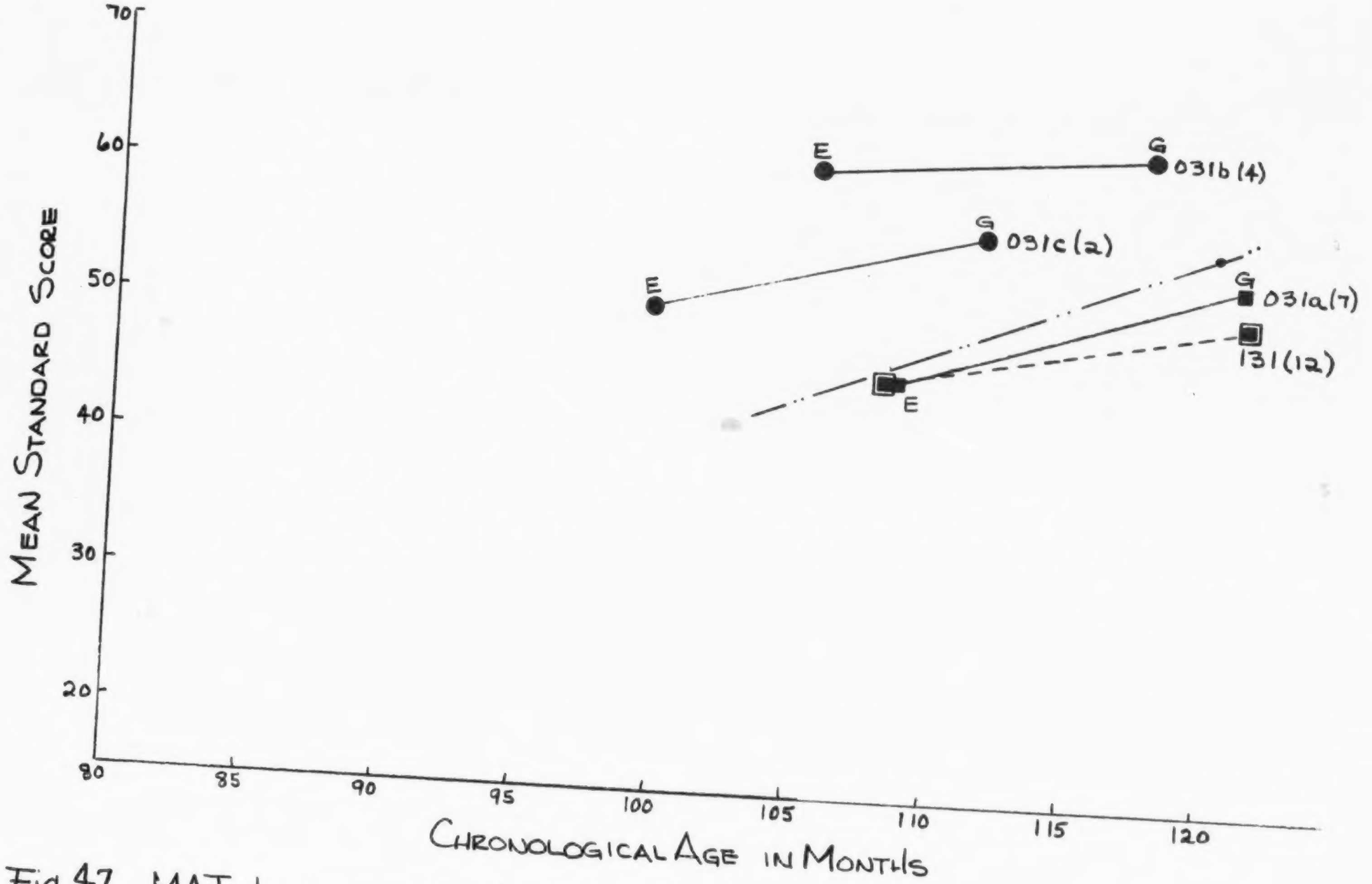

Fig. 47 MAT Language for all experimental and control groups in Target Area C.

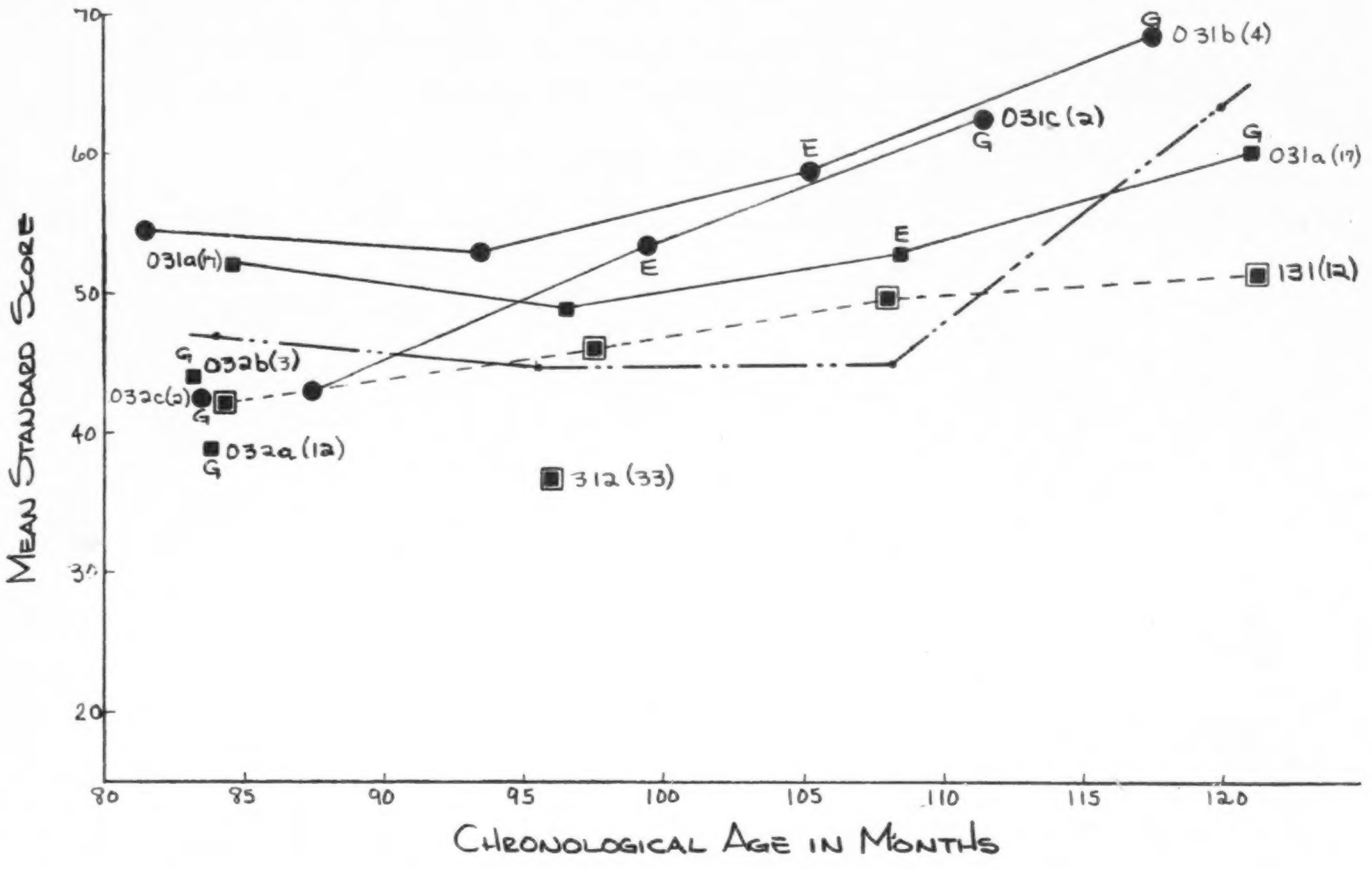

Fig. 48 MAT Arithmetic concepts and skills (Primary Form) and computation (Elementary Form) for all experimental and control groups in Target Area C.

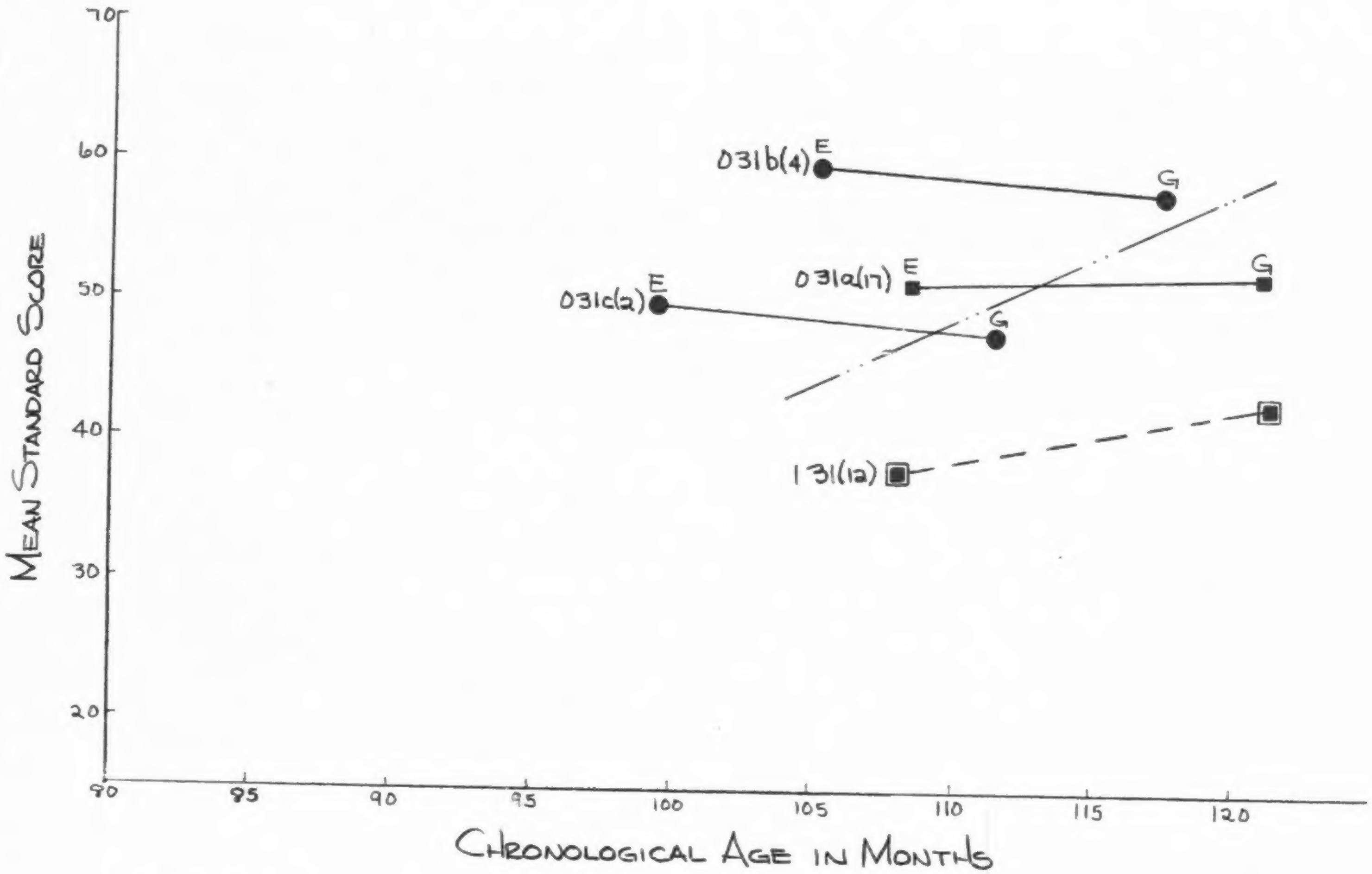

Fig. 49 MAT Arithmetic Problem Solving and Concepts (Elementary Form) for all experimental and control groups in Target Area C.

Table 83

Metropolitan Achievement Test
Means and Standard Deviations for Target Area D
for 1967 through 1970

Group	Proj. Yr.	N	Date of Admin.	C.A.	Battery-Form	Word Know.		Word Disc.		Reading		Arithmetic Concepts and Skills	
				Mn.		Mn.	S.D.	Mn.	S.D.	Mn.	S.D.	Mn.	S.D.
041a	2	7	S 67	84.0	Prim.I-A	38.3	2.6	34.7	3.8	40.3	4.7	37.4	5.2
	3	7	S 68	96.0	Prim.II-C	38.6	4.0	42.7	5.1	32.0	6.4	40.7[a]	4.4
	4	7	S 69	107.9	Elem.-C	38.3	2.5	42.6	2.1	38.1	3.7	—	--
	5	7	S 70	120.3	Elem.-C	44.1	8.2	44.6	7.0	42.6	7.4	—	—
041b	2	7	S 67	86.9	Prim.I-A	39.4	13.8	37.9	12.5	46.0	9.5	40.7	10.5
	3	7	S 68	97.0	Prim.II-C	41.7	16.3	42.4	12.7	41.7	13.0	49.1[a]*	12.6
	4	7	S 69	108.7	Elem.-C	42.6	12.0	47.0	12.2	45.4	11.9	—	--
	5	7	S 70	121.6	Elem.-C	50.6	14.8	51.1	13.6	51.1	12.6	--	--
041c	3	3	S 68	106.3	Prim.II-C	37.0	7.2	44.3	8.5	40.3	11.4	36.0[a]	6.6
	4	3	S 69	118.0	Elem.-C	39.0	5.3	40.7	6.7	34.7	2.5	--	--
	5	3	S 70	130.7	Elem.-C	41.7	11.0	39.0	7.5	37.0	6.9	--	--
042a	3	4	S 68	84.3	Prim.I-A	42.5	8.3	50.3*	14.6	40.8	9.1	38.5	6.4
	4	4	S 69	96.3	Prim.II-C	42.5	13.0	47.8*	11.2	42.0	8.4	31.8[a]	2.2
	5	5	S 70	112.0	Elem.-C	41.2	8.1	37.2	11.3	38.0	6.9	—	--
042b	3	10	S 68	84.2	Prim.I-A	37.2	9.1	38.4	7.2	36.1	4.9	31.9	6.6
	4	10	S 69	96.0	Prim.II-C	35.3	9.6	37.6	7.8	35.9	7.2	33.0[a]	4.8
	5	10	S 70	108.3	Elem.-C	32.7	9.3	31.0	10.3	32.1	7.5	--	--
044a	4	11	S 69	83.5	Prim.I-A	44.2	6.7	46.3	7.7	45.1	7.6	45.2	8.4
	5	11	S 70	95.5	Prim.II-C	39.6	8.0	42.6	7.3	42.5	9.5	43.5	10.6
044b	4	2	S 69	79.5	Prim.I-A	40.0	11.3	42.0	17.0	41.5	.7	47.5*	10.6
	5	2	S 70	92.0	Prim.II-C	46.5	3.5	41.5	7.8	39.0	4.2	44.0	9.9
141	3	18	S 68	104.8	Prim.II-C	41.2	6.3	44.9	6.0	40.7	7.8	42.2	8.7
	4	10	S 69	121.1	Elem.-C	37.4	6.4	42.1	4.6	37.4	7.1	--	—
	5	18	S 70	127.3	Elem.-C	41.6	6.7	43.9	7.5	41.3	8.5	--	--
142	3	20	S 68	87.0	Prim.I-A	45.7	6.6	46.5	9.7	45.1	8.5	42.7	8.6
	4	12	S 69	98.5	Prim.II-C	41.0	7.7	43.7	8.3	39.8	11.3	41.6[a]	9.5
	5	19	S 70	110.1	Elem.-C	40.4	9.7	43.1	8.2	40.3	6.7	—	--

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[a] Primary II Arithmetic is a total Arithmetic score composed of "Problem Solving and Concepts" and "Computations."

Note: All scores expressed as standard scores computed from the MAT statistics manual.

* Above MAT Subtest Norms.

Table 83 (continued)
Metropolitan Achievement Test Means and Standard Deviations
for Target Area D for 1967 through 1970

Group	Proj. Yr.	N	Date of Admin.	C.A. Mn.	Battery-Form	Word Know. Mn.	Word Know. S.D.	Word Disc. Mn.	Word Disc. S.D.	Reading Mn.	Reading S.D.	Arithmetic Concepts and Skills Mn.	Arithmetic Concepts and Skills S.D.
212	4	24	S 69	84.9	Prim.I-A	42.2	8.5	43.4	8.4	43.0	6.7	37.3	9.6
	5	24	S 70	96.0	Prim.II-C	37.7	7.8	39.7	8.2	36.8	7.1	36.0[a]	8.8
244	4	20	S 69	84.4	Prim.I-A	45.9	7.7	46.2	6.6	44.7	8.4	50.1*	6.1
	5	21	S 70	95.4	Prim.II-C	41.6	9.2	42.4	8.7	40.0	11.2	42.4[a]	7.9
312	5	33	S 70	96.0	Prim.II-C	38.3	7.9	42.4	9.8	38.5	8.2	36.8[a]	8.3
444	5	10	S 70	95.3	Prim.II-C	33.9	6.6	36.3	8.2	33.9	7.7	31.8[a]	8.1
544	5	14	S 70	95.4	Prim.II-C	39.4	7.8	38.9	9.9	38.7	8.6	36.3[a]	10.0

Group	Proj. Yr.	N	Date of Admin.	C.A. Mn.	Battery-Form	Spelling Mn.	Spelling S.D.	Total Language Mn.	Total Language S.D.	Arith. Comput. Mn.	Arith. Comput. S.D.	Arithmetic Problem Solving and Concepts Mn.	Arithmetic Problem Solving and Concepts S.D.
041a	2	7	S 67	84.0	Prim.I-A	—	—	—	—	—	—	—	—
	3	7	S 68	96.0	Prim.II-C	42.9	2.5	—	—	—	—	—	—
	4	7	S 69	107.9	Elem.-C	43.5	2.9	35.3	3.1	37.9	9.7	35.1	7.8
	5	7	S 70	120.3	Elem.-C	49.3	5.2	44.1	5.6	48.6	15.1	42.4	10.0
041b	2	7	S 67	86.9	Prim.I-A	—	—	—	—	—	—	—	—
	3	7	S 68	97.0	Prim.II-C	44.6	14.7	—	—	—	—	—	—
	4	7	S 69	108.7	Elem.-C	45.8	15.0	39.0	12.1	42.3	11.5	40.3	10.3
	5	7	S 70	121.6	Elem.-C	50.4	12.8	46.6	13.7	55.3	12.0	49.4	12.4
041c	3	3	S 68	106.3	Prim.II-C	41.0	3.6	—	—	—	—	—	—
	4	3	S 69	118.0	Elem.-C	44.0	9.9	34.0	3.6	38.0	8.7	36.7	6.7
	5	3	S 70	130.7	Elem.-C	43.7	10.5	35.7	4.2	47.3	18.0	37.7	6.4
042a	3	4	S 68	84.3	Prim.I-A	—	—	—	—	—	—	—	—
	4	4	S 69	96.3	Prim.II-C	45.5	11.6	—	—	—	—	—	—
	5	5	S 70	112.0	Elem.-C	41.2	14.1	37.6	4.8	34.0	5.7	35.8	4.5
042b	3	10	S 68	84.2	Prim.I-A	—	—	—	—	—	—	—	—
	4	10	S 69	96.0	Prim.II-C	37.6	7.2	—	—	—	—	—	—
	5	10	S 70	108.3	Elem.-C	34.8	7.7	30.8	6.4	37.3	10.3	35.2	9.1
044a	4	11	S 69	83.5	Prim.I-A	—	—	—	—	—	—	—	—
	5	11	S 70	95.5	Prim.II-C	50.6*	8.0	—	—	—	—	—	—
044b	4	2	S 69	79.5	Prim.I-A	—	—	—	—	—	—	—	—
	5	2	S 70	92.0	Prim.II-C	34.5	9.2	—	—	—	—	—	—

Table 83 (continued)
Metropolitan Achievement Test Means and Standard Deviations
for Target Area D for 1967 through 1970

Group	Proj. Yr.	N	Date of Admin.	C.A.	Battery-Form	Spelling		Total Language		Arith. Comput.		Arithmetic Problem Solving and Concepts	
				Mn.		Mn.	S.D.	Mn.	S.D.	Mn.	S.D.	Mn.	S.D.
141	3	18	S 68	104.8	Prim.II-C	48.2*	6.2	--	--	--	--	--	--
	4	10	S 69	121.1	Elem.-C	40.3	6.4	41.5	7.0	44.8	5.1	38.9	5.1
	5	18	S 70	127.3	Elem.-C	46.7	9.2	48.8	10.3	53.4	12.8	43.8	8.6
142	3	20	S 68	87.0	Prim.I-A	--	--	--	--	--	--	--	--
	4	12	S 69	98.5	Prim.II-C	45.2	7.2	--	--	--	--	--	--
	5	19	S 70	110.1	Elem.-C	44.0	10.0	38.9	8.7	37.5	9.1	37.1	8.1
212	4	24	S 69	84.9	Prim.I-A	--	--	--	--	--	--	--	--
	5	24	S 70	96.0	Prim.II-C	42.1	10.5	--	--	--	--	--	--
244	4	20	S 69	84.4	Prim.I-A	--	--	--	--	--	--	--	--
	5	21	S 70	95.4	Prim.II-C	44.0	9.2	--	--	--	--	--	--
312	5	33	S 70	96.0	Prim.II-C	44.5	7.1	--	--	--	--	--	--
444	5	10	S 70	95.3	Prim.II-C	40.3	3.4	--	--	--	--	--	--
544	5	14	S 70	95.4	Prim.II-C	40.5	8.5	--	--	--	--	--	--

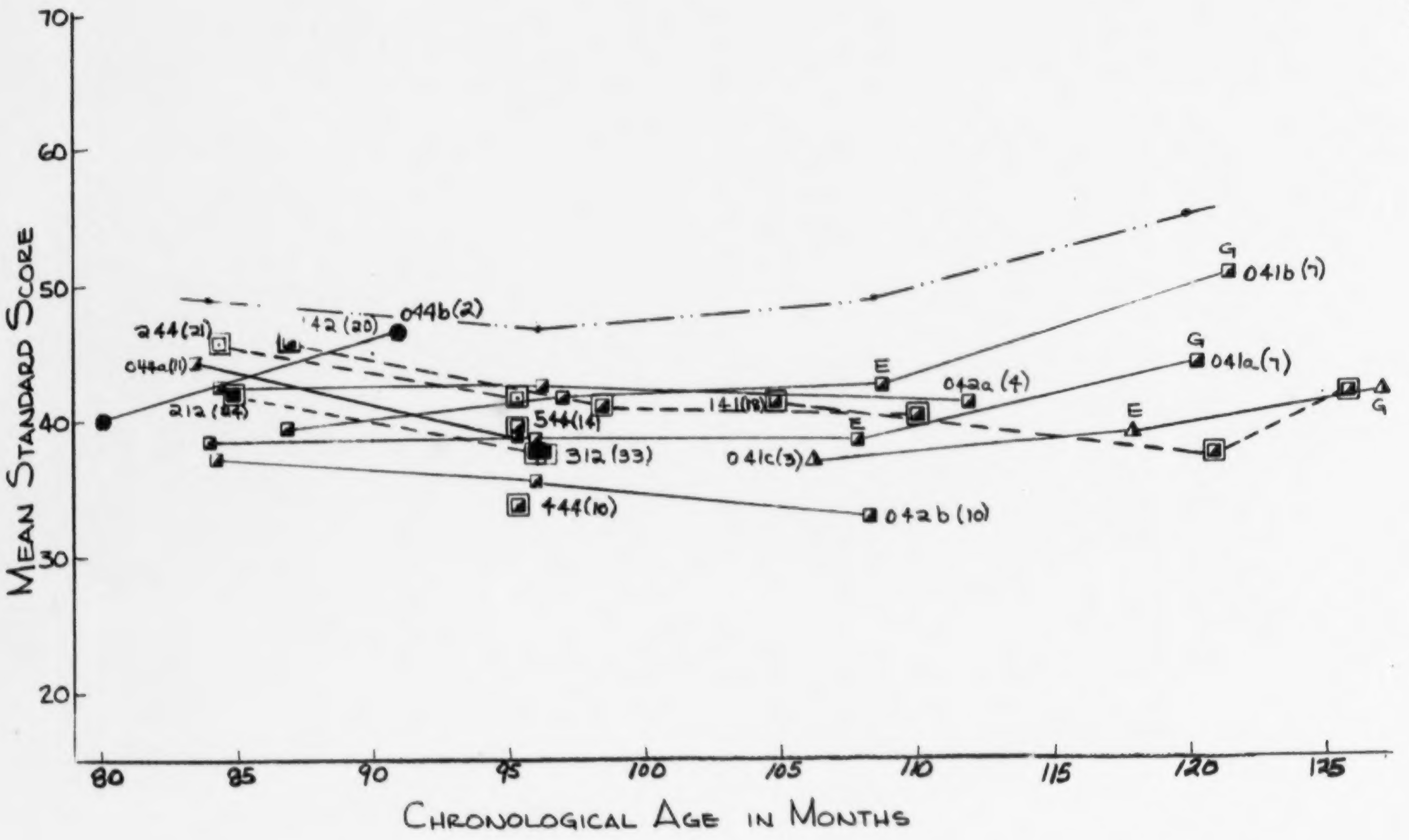

Fig. 50 MAT Word Knowledge for all experimental and control groups in Target Area D.

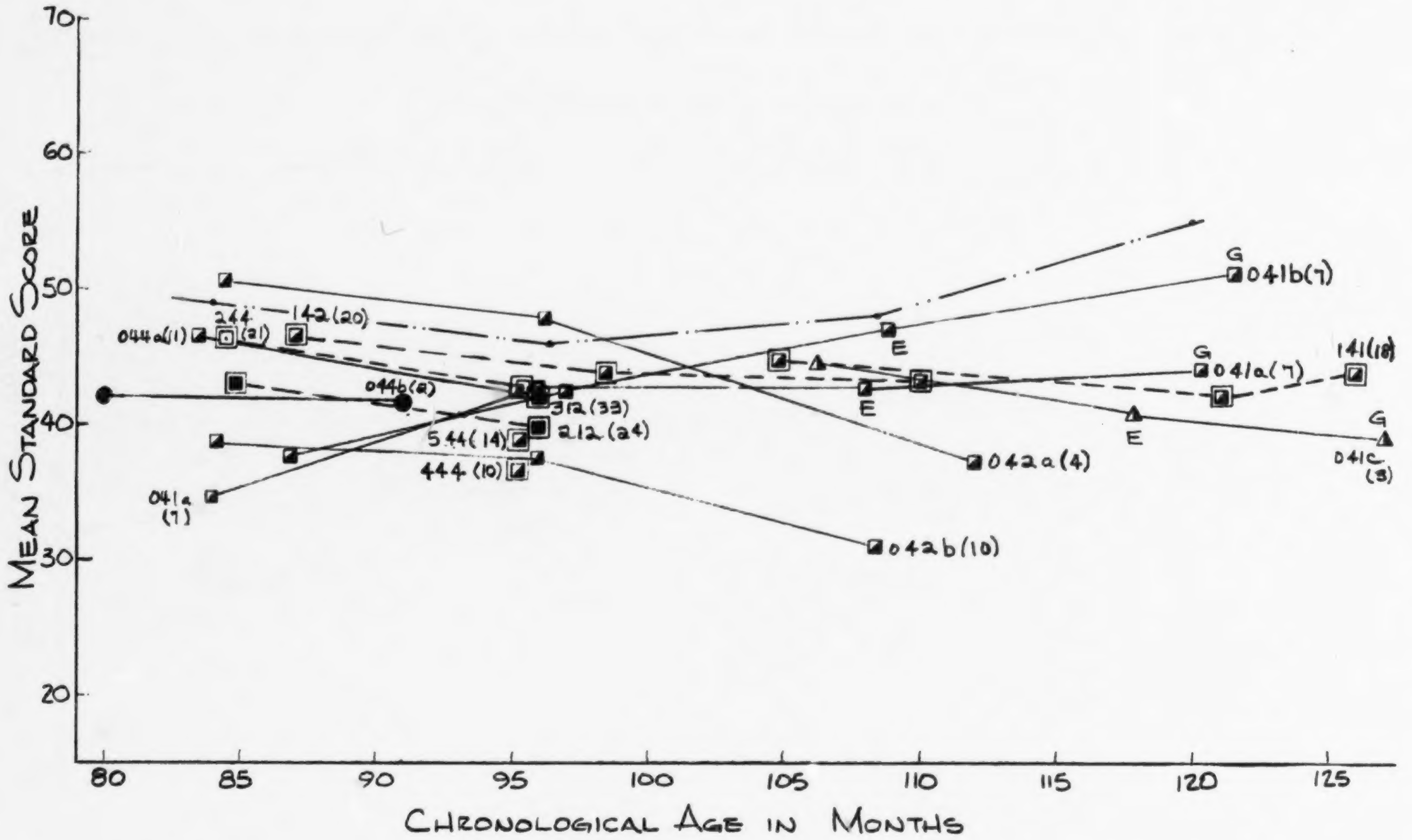

Fig. 51 MAT Word Discrimination for all experimental and control groups in Target Area D.

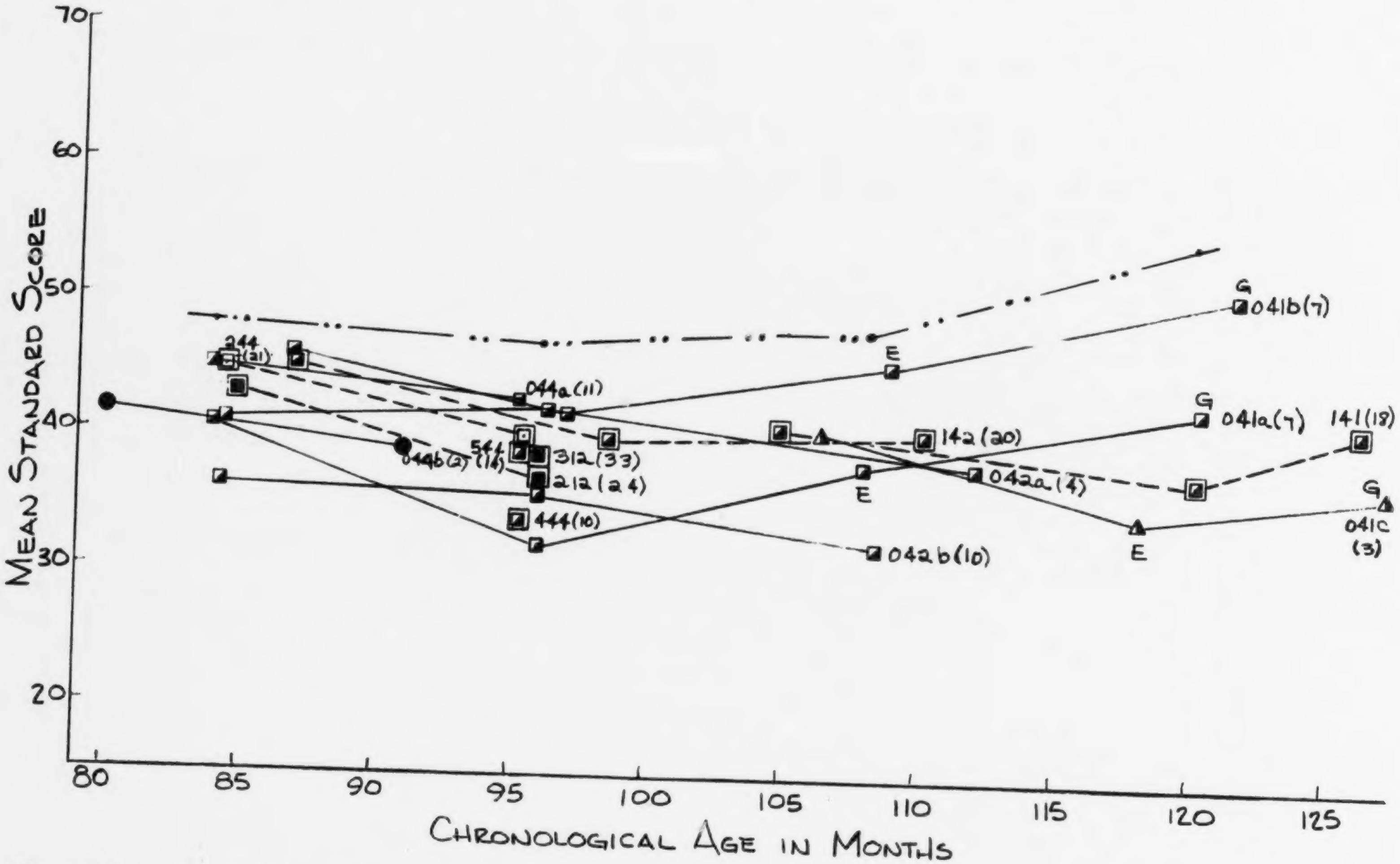

Fig. 52 MAT Reading for all experimental and control groups in Target Area D.

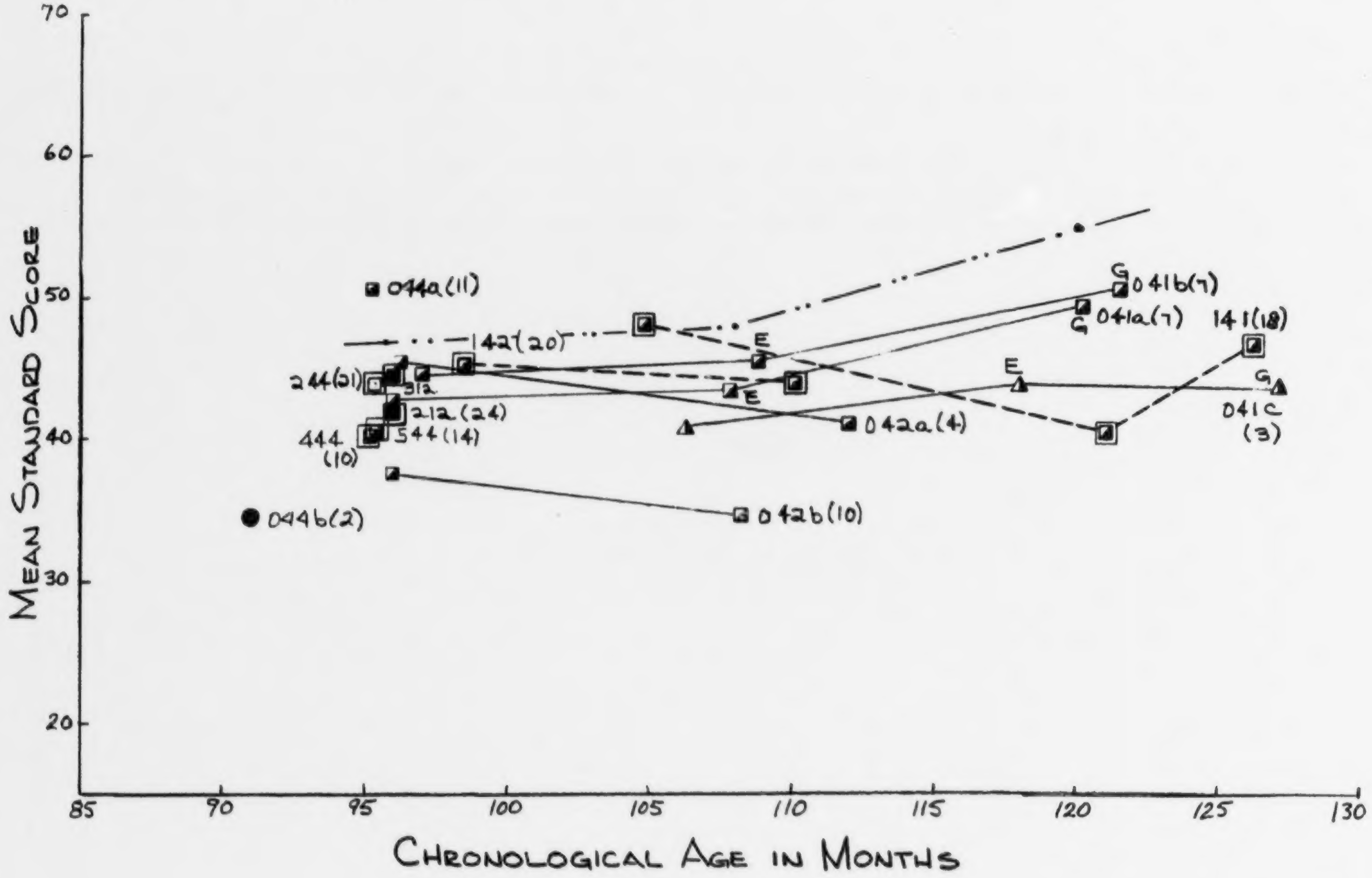

Fig. 53 MAT Spelling for all experimental and control groups in Target Area D.

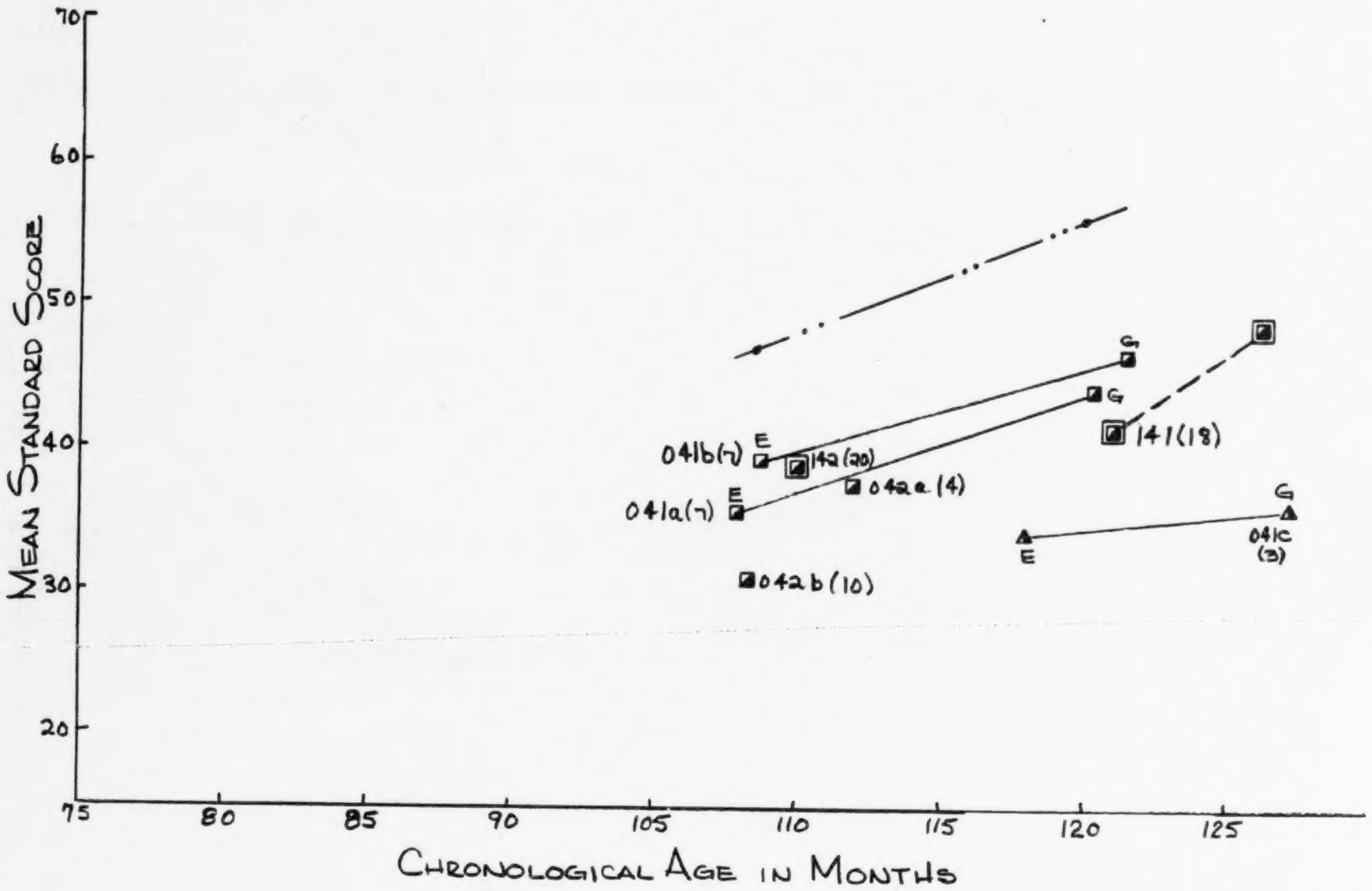

Fig. 54 MAT Language for all experimental and control groups in Target Area D.

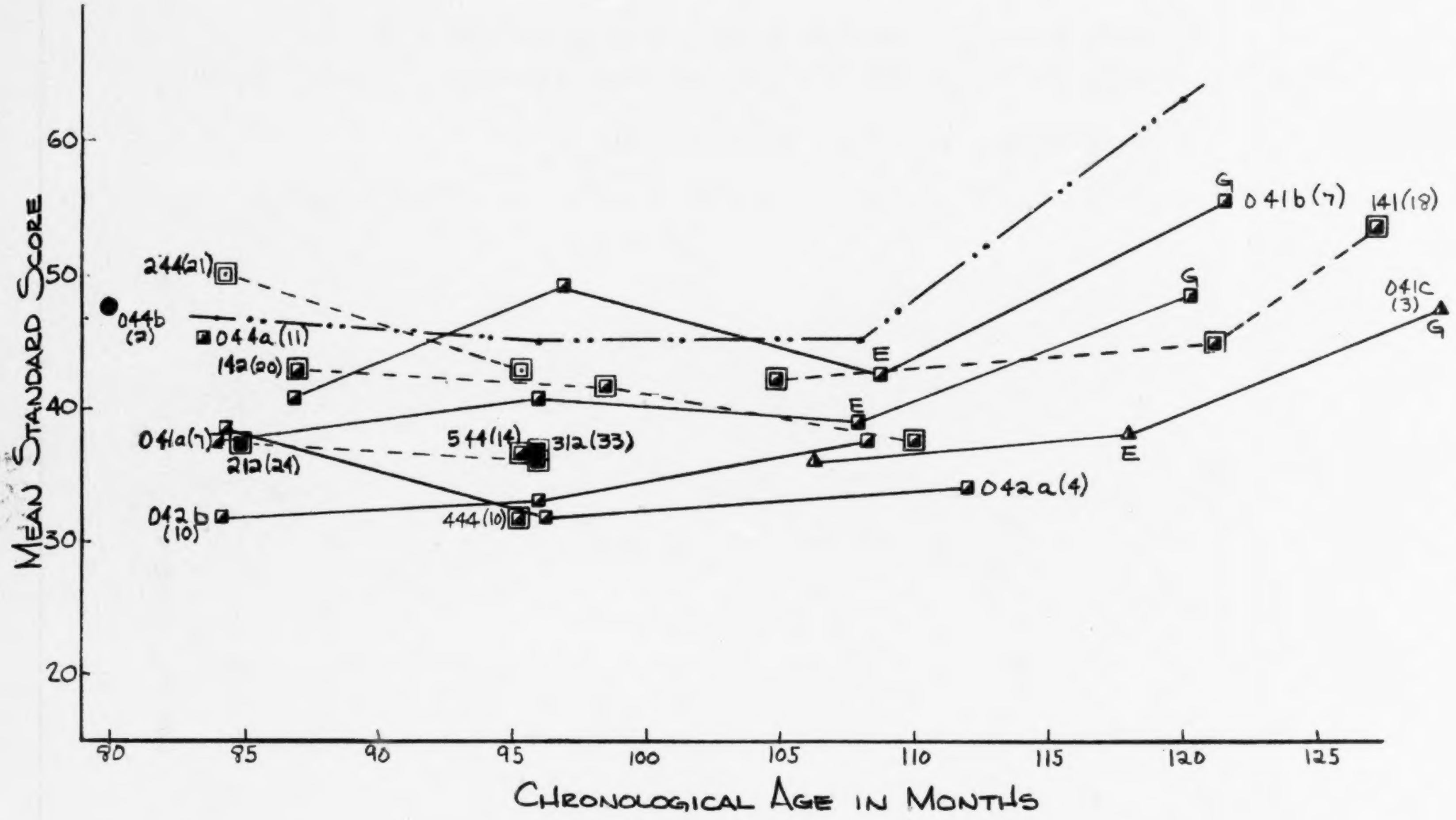

Fig.55 MAT Arithmetic Concepts and skills (Primary Form) and Computation (Elementary Form) for all experimental and control groups in Target Area D.

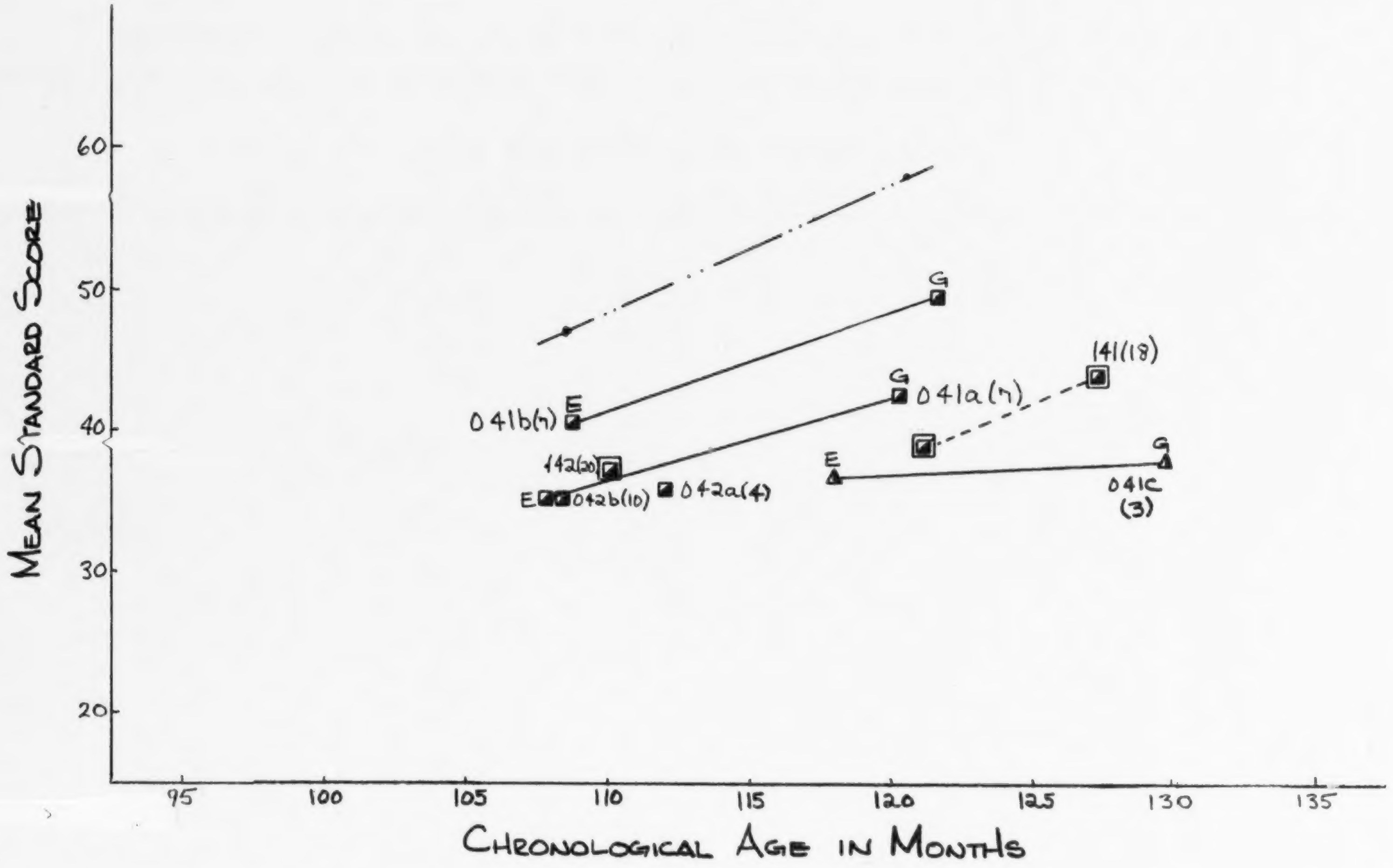

Fig. 56 MAT Arithmetic Problem Solving and Concepts (Elementary Form) for all experimental and control groups in Target Area D.

Summary of Findings Regarding Achievement

The main hypothesis regarding academic achievement (p. 160) predicted that "by the end of the third year of the ungraded primary the distribution of achievement scores on the Metropolitan Achievement Test (MAT), Elementary Form, will equal or exceed the national norms for the test."

Four EIP classes (incorporating 10 cohort groups) completed the third year of the ungraded primary. These were 022, 031, 041, and 042. Of the several cohorts making up these four classes only one (031b) achieved above the MAT norms in every sub-test at the end of the third year. This group of four (all girls) was selected by the Target Area C school principal and added to the 031a group when the 031a cohort group entered the first year of the ungraded primary. The four girls were probably not representative of the target area population. Their entry mean I.Q. was 98.5 (WISC).

The 031a (N-17) and 031c (N-2) groups performed exceptionally well in comparison with control groups and other EIP groups but they both failed to surpass the national norm for the Word Knowledge and Reading sub-tests. The 031a cohort also fell below the norm in the Word Discrimination and Language subtests.

These Target Area C children (suburban, black) were the ones who made the greatest progress in EIP. All the other experimental groups scored below the MAT norms in every sub-test at the end of the third year of the EIP primary. Clearly the prediction of achievement above the MAT norms was not realized in the Target Area B and D Schools. The eldest group of pupils in Target Area A had completed the second year of the primary when the project was terminated. At that point the 21 children in the class (composed of cohorts 012a and 012c) had achieved a mean above the MAT national norm in only two sub-tests - Word Discrimination and Spelling. These children were clearly superior to the Head

Start control group (212) but the criterion set at the beginning of the project had definitely not been reached.

Comparison of EIP Pupil Achievement with Controls

Five analyses of covariance were done comparing the performance of various groupings of EIP subjects on the MAT with available public school control groups. MAT means for EIP children at the end of the first, second, and third years of the ungraded primary were compared with MAT means obtained by children in the matched public school and Follow-Through classes. Scores obtained by children in all target areas were pooled in these analyses and the means were adjusted for differences in initial I.Q. The results are summarized in Table 84.

Table 84

Metropolitan Achievement Test (MAT) Means[a] and Analysis of Covariance F Values (adjusted for Entry I.Q.) for Various EIP Subjects and Control Groups at Four Grade Levels

Group	N	MAT Sub-tests						
		Word Know.	Word Disc.	Read.	Spell.	Total Lang.	Arith. Comp.	Arith. Pr. S.
EIP Subjects at End of First Year vs. Public 1st Grade								
EIP	96	39.95	41.48	41.71	---	---	39.51	---
Controls	75	43.95	45.52	44.32	---	---	40.25	---
F	(1,168)	11.554	8.261	4.882			0.053	
p		<.001	<.01	<.05			ns	
EIP Subjects at End of Second Year vs. Public 2nd Grade								
EIP	103	42.06	44.51	40.91	16.45[a]	---	46.43	---
Controls	142	39.69	42.02	39.19	15.23	---	44.35	---
F	(1,242)	2.648	2.690	0.968	0.930		2.225	
p		ns	ns	ns	ns		ns	
EIP Subjects at End of Third Year vs. Public 3rd Grade								
EIP	68	40.54	41.41	39.90	15.84	42.96	38.93	42.04
Controls	38	40.66	43.24	39.87	14.79	42.79	41.24	42.34
F	(1,103)	0.197	2.414	0.184	0.016	0.055	2.476	0.166
p		ns	ns	ns	ns	ns	ns	ns
EIP Pre-school Graduates at End of Public 1st Grade vs. Public 1st Grade								
EIP	29	43.45	44.04	43.62	---	---	33.76	---
Controls	75	43.95	45.52	44.32	---	---	40.25	---
F	(1,101)	0.773	1.901	0.915			13.405	
p		ns	ns	ns			<.001	
EIP Primary Graduates at End of Public 4th Grade vs. Public 4th Grade								
EIP	40	48.63	48.68	46.82	27.03	54.28	50.45	57.20
Controls	30	43.10	45.20	42.17	21.33	48.93	49.60	52.60
F	(1,67)	1.259	0.015	0.360	0.716	0.720	1.701	0.019
p		ns	ns	ns	ns	ns	ns	ns

[a] Standard Score means are given except for Spelling, in which raw scores were used.

As expected, EIP subjects performed significantly less well at the end of the first year of the ungraded program (in comparison with children in regular public school classes). As can be noted in Table 84 the matched public first grade subjects obtained significantly higher standard scores in Word Knowledge, Word Discrimination, and Reading. A non-significant difference was found in Arithmetic. This result was expected since the EIP curriculum emphasized socialization, problem-solving, and discovery learning. If effective, however, such an approach was expected to lead to higher MAT performance in later test batteries when thinking and problem-solving, in contrast to memory and speed of recall, are given greater emphasis.

By the end of the second year in EIP the experimental subjects obtained superior (but not significantly higher) mean scores in every subtest of the MAT. However, this pattern of markedly improved performance was not continued into the third year. Data for the third year comparison indicated no significant difference between the experimentals and controls.

Results of MAT Comparisons for Pupils One Year Out of EIP

Two comparisons of the public school performance of EIP graduates with public school pupils were made for this report. Children who entered regular public school first grades after experiencing EIP pre-school and/or kindergarten performed significantly less well than their controls in the MAT Arithmetic subtest. Non-significant differences were found in the other three subtests, but in no case were the MAT means for EIP preschool graduates higher than the control group means.

In the fourth grade comparison the EIP graduates obtained higher mean scores on every MAT subtest but differences in initial I.Q. were sufficient to account for the observed MAT differences.

These findings do not suggest that the EIP socialization program (in combination with various experimental curricula) was sufficient to prepare these children for the public schools as they are currently organized. EIP graduates demonstrated the same pattern of declining academic performance as their controls at the fourth grade level. In fact, incidental information gathered during the project suggested that the EIP program was counter-productive when the expectations of the public schools were considered. Parents, teachers, and children reported many instances in which EIP graduates were too independent, talkative, and active when they entered public schools. Their self-directive, problem-solving styles were in open conflict with the existing mores of the schools.

Differences in Effects of Various Experimental Curricula

Since the EIP teacher training approach emphasized individualization and problem-solving by teachers the instructional programs worked out by the teaching teams in the four target areas differed widely. Although statistical tests by target area (or by curricular element) are not yet available, an inspection of the data presented in Tables 80-83 and Figures 32-56 provided some information regarding obvious differences:

1. The academic curriculum used in Target Area B was singularly ineffective in preparing the pupils for achievement tests such as the MAT. The teachers in this school had used an experience story approach, supplemented with Sullivan linguistic readers and the Ginn basal program. The Greater Cleveland mathematics series was used as well. During the third year a remedial program using a variety of individualized techniques such as the Fernald method was provided, employing three trained teachers (in sequence) assisted by an aide.

Results at the end of the third year were only slightly improved compared with those obtained in prior years. The pupils were obviously doing better in class sessions but response to the MAT testing situation was poor and the resultant scores showed no improvement.

2. The curriculum developed in Target Area C appeared to be the most effective. It was highly individualized and utilized methods developed by Caleb Gattegno (Words in Color and Numbers in Color) which emphasize problem-solving with the aid of a colored, phonic code in reading and colored rods in arithmetic. These materials and methods were supplemented with experience stories, creative writing (using Harr Wagner Word Boxes), SRA and Sullivan linguistic readers, and SRA Reading Laboratories.
3. After the first year, cross-age grouping was used in Target Area C and the more advanced children were employed as tutors of younger children. Second and third year children assisted the teacher during the fourth and fifth years of the Project with results which reflected those observed earlier (Project years two and three) in Target Area C.

Post hoc explanations are useful primarily as sources of hypotheses to be tested in future studies. The MAT differences observed in the four target areas are suggestive but they cannot be accepted as evidence of the superiority of the instructional materials and methods used in Target Areas A and C. Caution in generalizing these results is warranted also because of the high degree of curricular overlap between the programs developed in each of the four Target Area schools. Relationships between curricular elements and pupil achievement will be the subject of future statistical analyses and reports.

Effects of EIP Treatments on Language Development

Although no effort was made to gather ITPA language performance data on all experimental subjects, a number of special studies using matched groups were completed. After these special studies were made, the ITPA was administered periodically throughout the remaining years of the Project to all subjects who had participated in the special studies. Additional experimental and control subjects were added to this pool to provide a more adequate longitudinal sample from the four target areas.

Findings for all the ITPA sub-tests are available and will be reported in subsequent articles but only the results for ITPA Total Language Age are given here. Tables 85 through 88 and Figures 57 through 60 present ITPA Total Language Ages for matched groups of experimental and control subjects in the four target areas at successive chronological ages.

Table 85

The Illinois Test of Psycholinguistic Abilities Means and Standard Deviations for Target Area A for 1967 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	Total L.A. Mn.	Total L.A. S.D.
011a	3	F 67	4	54.8	3.4	45.0	6.6
		S 68	4	61.3	3.9	55.0	2.6
	4	F 68	4	65.3	3.9	54.5	3.3
		S 69	3	71.7	5.1	62.3	4.5
	5	F 69	4	78.0	3.7	66.8	3.8
		S 70	4	84.3	4.6	74.0	6.2
011c	3	F 67	6	52.7	4.0	43.3	10.3
		S 68	3	59.7	4.0	52.7	7.0
	4	F 68	6	63.3	4.2	55.2	9.9
		S 69	2	68.0	2.8	54.5	3.5
	5	F 69	6	75.8	4.3	64.8	8.1
		S 70	6	84.0	3.8	70.7	7.2
011d	4	F 68	2	65.5	0.7	53.5	2.1
	5	F 69	2	78.0	0.0	62.0	2.8
		S 70	2	85.5	0.7	73.0	8.5
012a	3	F 67	12	66.4	3.7	57.3	10.6
		S 68	6	74.0	4.4	66.3	8.8
	4	F 68	12	77.5	3.5	69.2	12.7
	5	F 69	12	89.8	3.7	76.3	14.9
		S 70	12	95.7	3.4	82.1	14.0
012c	4	F 68	9	78.3	4.2	67.2	5.7
	5	F 69	9	89.7	4.5	80.1	11.6
		S 70	9	95.2	4.3	88.7	11.9
013a	5	F 69	7	53.6	2.4	46.3	5.2
		S 70	7	59.0	2.9	51.9	5.3
111	5	S 70	5	86.4	3.4	72.2	8.9
121	5	S 70	5	77.0	2.6	61.4	7.8
144	4	F 68	24	76.9	3.4	67.2	10.4
		S 69	21	81.5	3.1	73.2	10.6
	5	F 69	20	88.1	3.3	78.9	14.8
		S 70	22	94.5	3.9	85.6	11.9

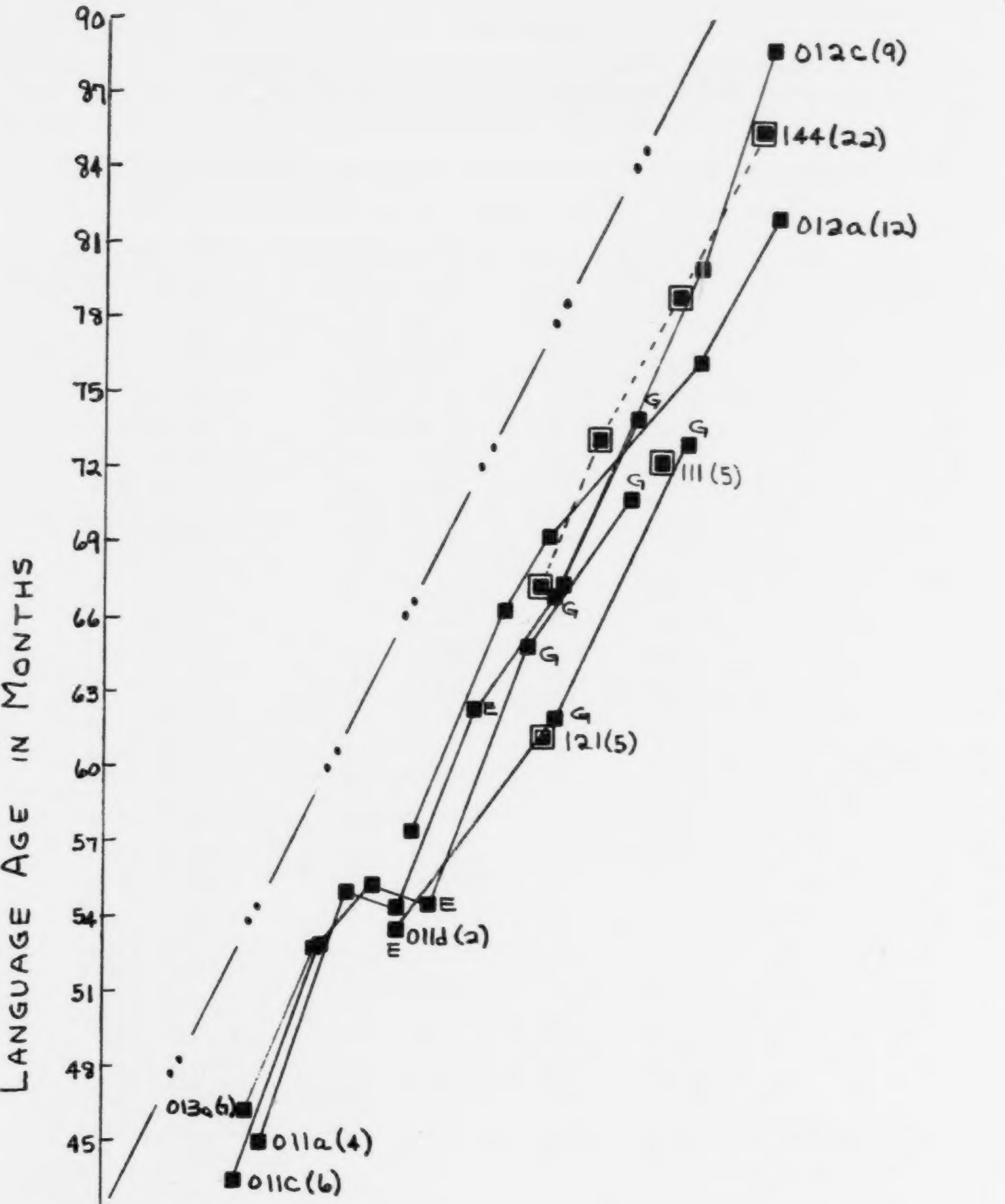

Fig. 57 ITPA Language Age for all experimental and control groups in Target Area A

Table 86

The Illinois Test of Psycholinguistic Abilities
Means and Standard Deviations for Target Area B
for 1967 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	Total L.A. Mn.	Total L.A. S.D.
021a	4	F 68	9	53.3	5.4	49.8	6.4
	5	F 69	10	65.3	5.1	61.5	3.7
		S 70	10	71.3	5.5	68.1	5.6
021b	4	F 68	3	53.7	4.6	49.3	5.5
	5	F 69	3	65.7	4.6	60.3	4.9
		S 70	3	71.3	4.0	65.7	4.0
021c	4	F 68	3	55.0	1.7	47.0	10.6
	5	F 69	3	67.0	2.0	60.0	7.9
		S 70	3	73.7	2.3	67.0	10.8
022a	3	F 67	7	78.0	2.8	67.0	5.9
		S 68	3	81.3	1.5	72.0	1.7
	4	F 68	7	89.3	3.0	78.4	4.6
	5	F 69	7	100.7	2.9	85.7	8.6
		S 70	6	106.7	2.8	93.7	7.1
022b	3	F 67	6	78.2	4.9	64.7	6.0
		S 68	5	81.8	4.9	65.8	9.1
	4	F 68	6	89.7	4.9	71.7	12.5
	5	F 69	7	100.6	4.3	81.1	13.7
		S 70	5	104.4	1.7	85.6	12.5
121	5	S 70	5	77.0	2.6	61.4	7.8
122	5	S 70	3	105.3	4.6	97.0	13.1
142	3	S 68	12	86.3	7.9	73.3	8.5
	4	F 68	19	93.1	7.4	80.0	11.1
	5	F 69	14	100.4	2.5	85.4	13.1
		S 70	15	105.3	2.8	92.3	11.5

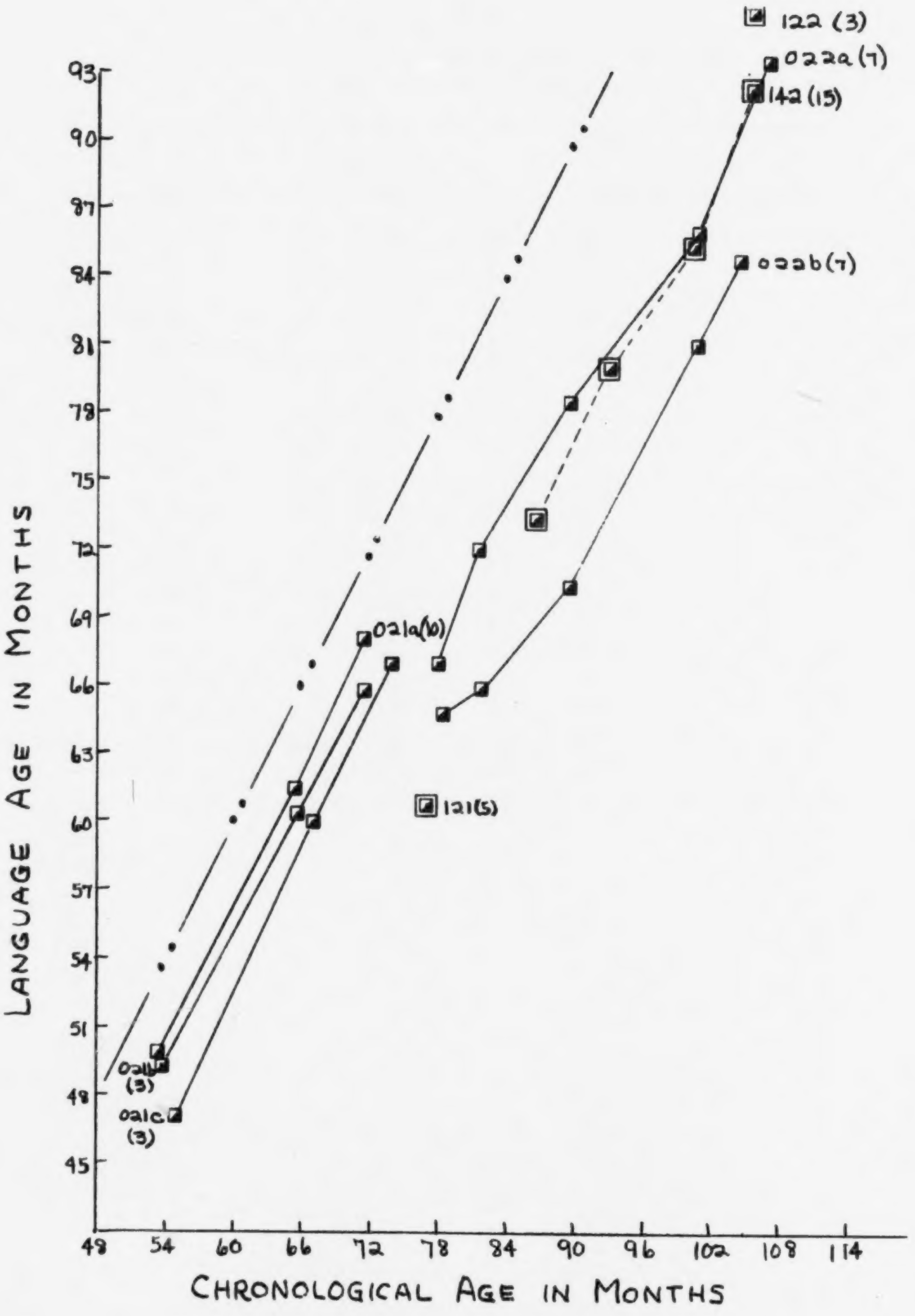

Fig. 58 ITPA Language Age for all experimental and control groups in Target Area B

Table 87
The Illinois Test of Psycholinguistic Abilities Means and Standard Deviations for Target Area C for 1967 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	Total L.A. Mn.	Total L.A. S.D.
032a	3	F 67	12	53.7	3.2	52.7	4.9
		S 68	8	60.0	2.9	56.5	7.1
	4	F 68	12	64.6	3.1	62.7	6.6
		S 69	7	71.0	3.2	64.0	6.0
	5	F 69	12	76.8	3.0	71.3	8.0
		S 70	12	83.0	3.6	80.5	8.9
032b	3	F 67	3	53.0	3.6	49.7	9.2
	4	F 68	3	64.0	3.6	65.0	17.8
	5	F 69	3	75.3	3.1	77.7	13.8
		S 70	3	81.3	3.8	86.0	22.3
032c	4	F 68	2	64.5	2.1	59.5	10.6
		S 69	2	70.5	2.1	66.5	6.4
	5	F 69	2	75.5	2.1	69.0	8.5
		S 70	2	82.5	2.1	73.0	11.3
111	5	S 70	5	86.4	3.4	72.2	8.9
144	4	F 68	24	76.9	3.4	67.2	10.4
		S 69	21	81.5	3.1	73.2	10.6
	5	F 69	20	88.1	3.3	78.9	14.8
		S 70	22	94.5	3.9	85.6	11.9

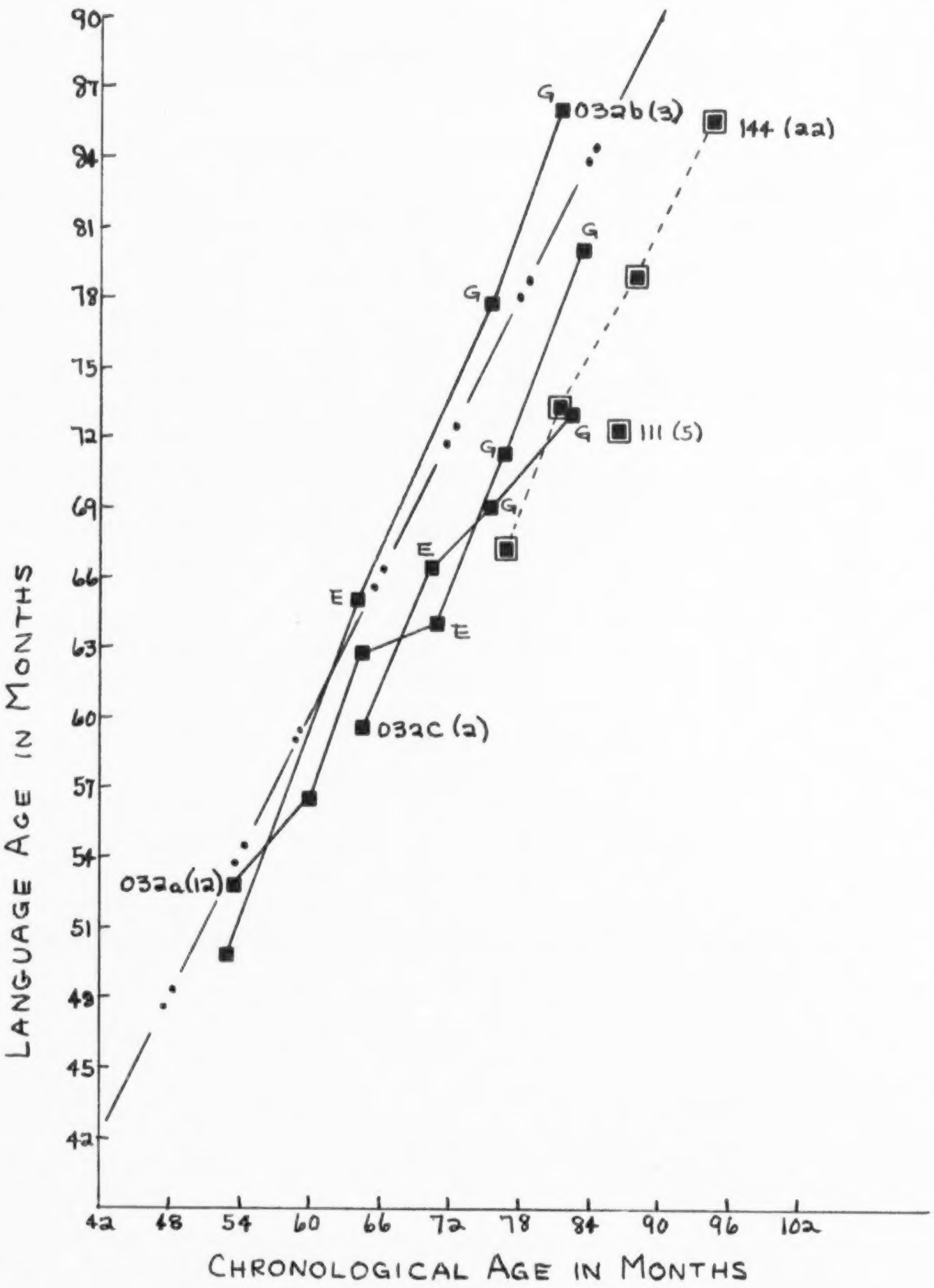

Fig. 59 ITPA Language Age for all experimental and control groups in Target Area C.

Table 88

The Illinois Test of Psycholinguistic Abilities Means and Standard Deviations for Target Area D for 1967 through 1970

Group	Project Year	Date of Admin.	N	C.A. Mn.	C.A. S.D.	Total L.A. Mn.	Total L.A. S.D.
042a	3	F 67	4	78.0	3.9	69.5	12.4
		S 68	2	81.0	2.8	77.0	14.1
	4	F 68	5	93.4	8.3	85.6	14.2
	5	F 69	4	101.5	3.9	87.3	18.2
		S 70	4	107.0	3.4	92.3	13.6
042b	3	F 67	10	77.7	6.2	64.0	10.0
		S 68	4	86.3	9.7	71.8	15.5
	4	F 68	10	89.6	6.0	74.9	12.3
	5	F 69	9	100.0	5.0	85.7	8.2
		S 70	8	104.9	2.4	90.3	14.3
044a	4	F 68	11	75.3	3.6	65.6	9.5
		S 69	11	82.1	3.7	70.5	7.0
	5	F 69	11	88.5	3.7	75.5	11.4
		S 70	10	93.7	3.8	83.5	9.3
044b	4	F 68	2	72.5	0.7	71.0	12.7
	5	F 69	2	84.5	2.1	80.0	11.3
		S 70	3	91.3	2.1	83.0	16.6
122	5	S 70					
142	3	S 68	12	86.3	7.9	73.3	8.5
	4	F 68	19	93.1	7.4	80.0	11.1
	5	F 69	14	100.4	2.5	85.4	13.1
		S 70	15	105.3	2.8	92.3	11.5

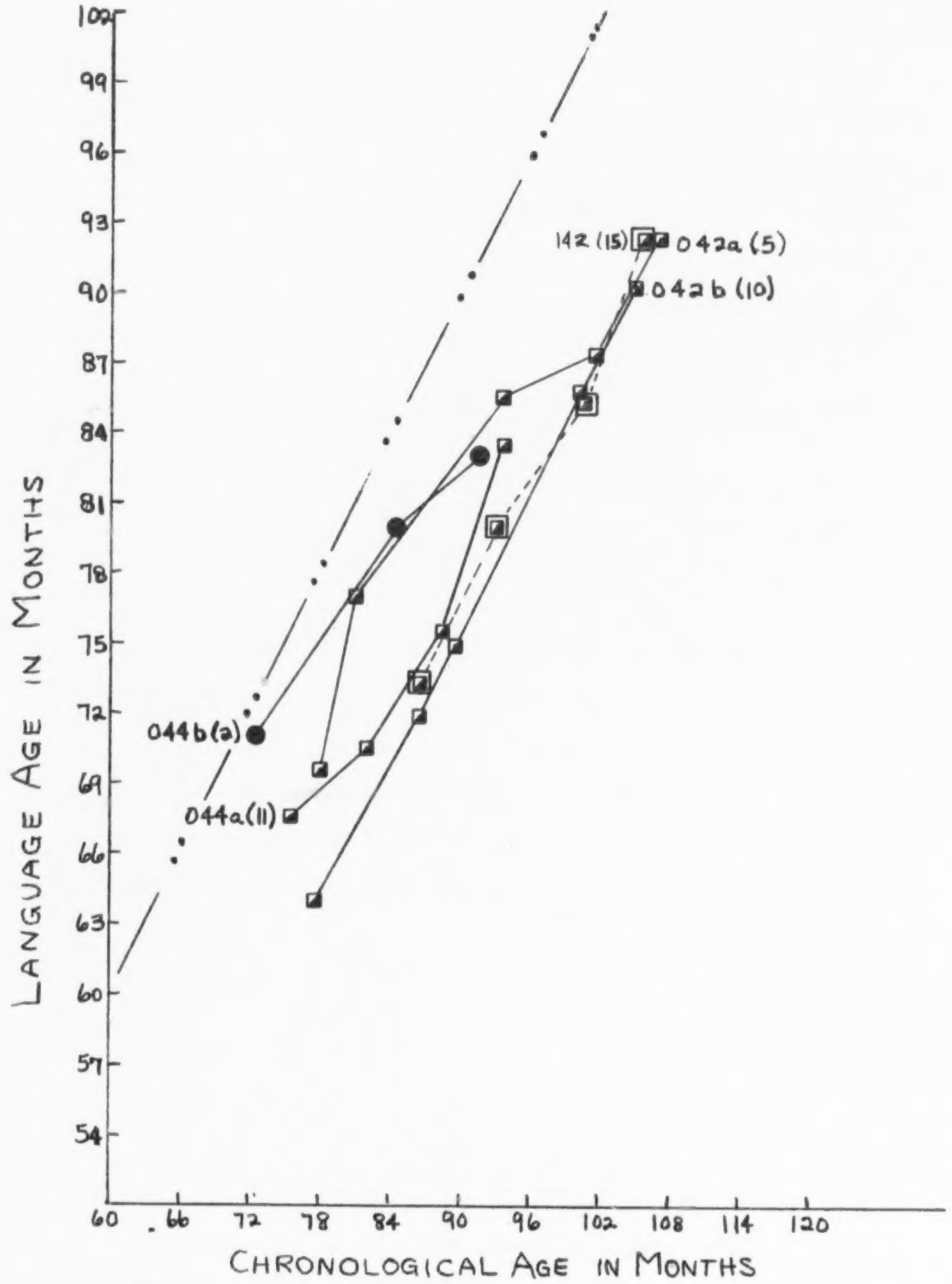

Fig. 60 ITPA Language Age for all experimental and control groups in Target Area D

Comparison of Changes in ITPA Scores Between EIP Subjects and Matched Controls

When subjects in the four target areas were matched on entry I.Q., sex, ethnic origin, and target area and compared on gains in ITPA Total Language Age no significant differences were found. Table 89 presents the appropriate data. An analysis of variance produced a non-significant F.

Table 89

Mean I.Q. and ITPA Scores at Entry and
Mean Exit ITPA Scores for Selected Experimental and Control Subjects

Group Code	Group	N	Mean Entry ITPA	Mean Entry I.Q.	Mean Exit ITPA
D	Experimentals (with appro. scores)	190	65.11	90.86	80.58
F	Controls (with appro. scores)	32	74.34	90.78	84.53

Even though matched on several variables (I.Q., sex, ethnicity, and target area) the two groups in Table 89 were found to differ substantially in entry ITPA Language Age (about 9.2 months). When an analysis of covariance was computed adjusting for differences in entry ITPA Language Age a non-significant F was obtained. The EIP treatment was not found to have a different effect on language development as measured by the ITPA (in comparison with matched controls).

Effects of Age of Entry and Length of EIP Treatment on Gains in ITPA Language Age Scores

In order to test the effects of age of entry to EIP programs and length of treatment (in EIP) a four by three analysis of covariance was made. Four ages of entry and three lengths of treatment were employed. Final ITPA Language Ages were adjusted for differences in initial ITPA Language Age.

Table 90

Design of Four by Three Analysis of Covariance

	Length of Treatment		
Entry Age	Level 1 (4 to 16 mo.)	Level 2 (17 to 28 mo.)	Level 3 (29 to 40 mo.)
Level 1 - 2 & 3 yr. olds	N = 2	N = 17	N = 10
Level 2 - 4 yr. olds	N = 2	N = 17	N = 5
Level 3 - 5 yr. olds	N = 2	N = 10	N = 22
Level 4 - 6, 7, & 8 yr. olds	N = 21	N = 61	N = 18

The design presented in Table 90 grouped children with various entry ages according to length of participation in EIP. Since the school year extended about 9 months those who had attended approximately one year were included in the first column. Those with 2 or 3 academic years in EIP were placed in column two. Pupils who remained 4 or 5 school years were included in the third column. Table 91 presents the mean gains in ITPA Language Age for the 12 cells (unadjusted for differences in initial ITPA L.A.). Results of the analysis of covariance (adjusting final ITPA Language Ages for differences between groups on initial ITPA Language Age) are given in Table 92.

Table 91

Mean Gains in ITPA Language Age by Age of Entry and Length of Treatment

	Length of Treatment		
Age of Entry	4 to 16 mo.	17 to 28 mo.	29 to 40 mo.
2 or 3 yrs.	5.00	21.53	19.20
4 yrs.	4.50	23.53	24.60
5 yrs.	7.00	20.60	13.73
6, 7, or 8 yrs.	13.81	14.82	6.89

Table 92

Analysis of Covariance
Effects of Age of Entry and Length of Treatment on Final ITPA Language Age
(adjusted for initial ITPA L.A.)

Source	SS	df	MS	F	p less than
Within cells	18012.27	174	103.52		
Regression	11254.14	1	11254.14	108.716	.001
A (age of entry)	213.54	3	71.18	0.688	.561
B (length of treatment)	867.22	2	433.61	4.189	.017
AB (interaction)	1389.25	6	231.54	2.237	.042

The results presented in Tables 91 and 92 support the rejection of the null hypothesis of no difference ($p < .017$) in the case of length of treatment. No significant main effects of age of entry were observed.

The EIP treatments were significantly more effective in increasing ITPA Language Age when continued for 17 to 38 months. Beyond (or under) that period diminishing rates of improvement were observed.

The significant interaction found between effects of age of entry and length of treatment suggests that the most efficient strategy is to enroll children in an EIP type of treatment at age 4 providing the special intervention can be continued for at least 17 months (two academic years). If only one year of special compensatory programming of the EIP type is possible the greatest effect (at the end of one year) may be expected among those enrolled at 6 or 7 years of age.

CHAPTER FIVE

Conclusions

The primary purposes of this volume were to report in some detail on the research strategies employed, the intervention rationale, the demographic characteristics of the EIP families and their children, the kinds of curricular experiences and programs developed by EIP teachers and specialists in the various target schools, and the changes observed in the children as a function of exposure to and involvement in the various experimental EIP treatments.

Chapters One through Four were written with these goals in mind. One final task remains before closing this report: Now that the shape of EIP's overall impact has emerged from the welter of measures, observations, interviews, special studies, assessments, tables, figures, and statistical tests, what can be said in summary fashion regarding the questions posed earlier (pp. 158 - 159)? Answers to these questions are based on an analysis of all the various types of data available including the reports of outside evaluators which are presented in Volume II (appendixes).

What Has Been the Impact of EIP on the Children?

Findings:

1) Socialization

- Changes in social behavior were found to be more a function of specific setting variables than entry age. Among the relevant setting variables, teacher behavior was found the most salient. Social reinforcers and limit setting behaviors (on the part of adults present) were found to shape pupil social behavior independently of age of entry to EIP treatment programs. The longer a child remained in EIP the more independently productive he became in non-teacher-directed classroom settings, without concurrent decrements in conforming and cooperative behavior in teacher-directed situations.

2) Intellectual Development

- Children with no pre-school experience were found to decline rapidly in tested I.Q. during or shortly after the second year of life. This decline amounted to a total of approximately 10 to 15 points during the third and fourth years. After about age four or five the decline slowed to 2 or 3 points per year.
- EIP experimental programs were found to reverse the decline in tested I.Q. Experimental subjects gained, on the average, a total of 5 or 6 points during their participation in EIP programs. Gains made early in the experimental programs were not washed out after two or three years of EIP school experience.
- Control group children were observed to have constant I.Q. scores after entry to public school.
- The younger a child entered an EIP sequence of educational programs the higher he was likely to score on the Stanford-Binet at exit. This result was due, apparently, to the fact that the younger children's I.Q. had, at entry, declined less (in comparison with the I.Q.'s of children of older entry ages) rather than to differences in program efficiency at various chronological ages. Length of EIP treatment was not found related to gains in tested I.Q. Similar gains in I.Q. were observed in children whether they experienced one or more years in EIP. Losses were not observed to follow gains made early in EIP programs.

- The distribution of I.Q. scores obtained by EIP subjects at exit approached a normal probability curve, with a mean of approximately 5 points less than the test norms. A bimodal distribution observed at entry was no longer apparent at exit.

3) Language Development

- EIP treatments were not found to have different effects on language (ITPA) development in comparison with children in various control groups. However, the EIP educational programs were found to be significantly more effective if continued for 2 school years or more in comparison with a one year EIP intervention. Also, the EIP programs resulted in significantly greater ITPA gains among experimental children when they were enrolled for two or more years with an entry age of four (in comparison with other lengths of treatment and ages of entry).

4) Academic Performance

- Children in EIP programs were found to perform significantly less well than children at the end of the first year of primary school (normally called first grade). By the end of the second or third year of EIP ungraded primary experience, EIP pupils on the average scored higher (on most sub-tests of the MAT) than their controls, but the differences were non-significant. EIP children did not (on the average) achieve above the national MAT norms.
- Losses in position relative to MAT norms were experienced by EIP pupils after departure from EIP programs and entry to the public schools. Control children showed similar losses relative to the MAT

norms. EIP graduates in the first and fourth grades of public school were not significantly different in MAT performance from their public school matched controls.

- Age of entry did not appear to be a factor in these findings, however, most of the children entering EIP at 2, 3, or 4 years of age had not reached the second or third year of the elementary school when the project was terminated. Readiness data on the graduates of the Infant Project (now aged 4 and 5) suggest that these subjects are likely to perform in a superior fashion at entry to public school. Since they will not enter EIP ungraded primaries, it will not be possible to test the effects of the EIP primary programs on children who have been observed and tested since birth and educated in EIP pre-schools since two years of age. Their EIP experience will end when they complete kindergarten in the spring of 1971.

Concluding Statement

The findings presented here are based upon an analysis of all the data presented in Chapters One through Four. These conclusions were tempered by observations made and discussions held regarding the experimental and control pupils during the five years of the project. The findings are presented as accurately as possible, however, they are seriously subject to contamination. The data need to be examined further using more refined statistical analyses to gain a firmer hold on the effects of specific variables in the Durham EIP.

Relationships between teacher and pupil characteristics and dependent variables (such as the influence of Style E or F behavior on achievement) are of special interest. The interaction between family variables and school performance is another area to be investigated further.

The discovery of relationships between various EIP curricular programs, teacher behaviors, and pupil performance (both social and academic) would be especially useful to those educators and researchers seeking to establish dependable early intervention programs. The combination of materials, instructional methods, school management systems, differentiated staffing, etc., found most effective in EIP needs to be compared with the results obtained with contrasting experimental interventions in other settings.

Reports on these and other topics related to the five year program in Durham will be made through professional journals as time and resources allow.

The major finding of this five-year longitudinal study is that in-service teachers can be taught to use differentiated reinforcement treatment programs which will develop desirable social skills in their pupils and enhance their intellectual development.

This result is especially encouraging to those who have been looking for evidence that dimensions of social transactions are correlated with intellectual performance. The next step is to link changes in social development (influenced by specific teacher behavior) with changes in academic gains. The existence of such linkages is suggested by correlations found in this study (between social behavior and reading performance) but experimental studies are needed to provide reliable data.

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